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NOTICES:—All communications relating to editorial matter should be addressed to the Editor, who will be pleased to consider articles or contributions dealing with modern chemical developments or suggestions bearing upon the advancement of the chemical industry in this country. Communications relating to advertisements or general matters should be addressed to the Manager.

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Our New Dyestuffs Supplement

IN response to many suggestions, we publish this week the first issue of a Dyestuffs Monthly Supplement, which we hope may have some influence in stimulating a discussion of current dyestuff problems in this country and in helping towards a better co-ordination of effort among British makers and a closer understanding between producers and consumers. As the contents of this first issue show, many of the problems are still of an acute character, and none more so than the question of price. To recognise this state of opinion in the industry is not to endorse or encourage unhelpful criticism. On the contrary, it is a necessary condition of mutual understanding, and so far as it is sincere and meant to be honestly constructive a comparison of conditions from different points of view is to be welcomed. Although there are still points on which the users and the makers have not succeeded in entirely accommodating each other, there has been a steady approach towards this end for some time past. It has been possible in several cases to reduce prices substantially, and as efficiency in production advances, as it is undoubtedly doing, the position should become more and more satisfactory. What is wanted is a genuine co-operative effort on behalf of the industry as a whole, as the result of which both parties must ultimately gain.

We are indebted to several influential figures in the industry for contributions of real value to our first number, and we shall hope to deserve and obtain similar assistance in the future. Mr. Sutcliffe Smith's article on the present position from the users' point of view sets an excellent example of frank but fair criticism. From another point of view our special survey of the technical progress in research and commercial production achieved in 1925 is not only a valuable piece of information but reassuring evidence of the sound lines on which work is proceeding. The personal note is supplied by a sketch of the career of Sir Edward Brotherton, an honoured and successful figure in dyestuffs manufacture and in chemical industry generally. The glimpses of important works we hope to publish from time to time will give readers some idea of what dyestuffs production means on the engineering and organisation sides. Finally, we are indebted to several correspondents for their notes on current market conditions. To our thanks for all this helpful co-operation need only be added an assurance of our desire to make this supplement of real service to the industry and our appreciation of any notes on points of interest that readers may be good enough from time to time to forward.

The Limitation of Ammonia Production

THE rapid development of the synthetic ammonia industry, not alone in this country but on the continent and in America and Japan, is causing chemical and fertiliser manufacturers to give consideration to the problem of what ultimately will be the outcome of the present activity and what conditions will limit the manufacture of synthetic ammonia products. Nitrate of soda and ammonium sulphate have been competitors for many years now, and it is interesting to trace the production figures and the prices realised for these fertilisers during the last quarter of a century. Nitrate of soda still finds an important use where rapidity of fertilising action is required, for before ammonium sulphate can be assimilated and full advantage taken of it by the crops it requires, generally speaking, to be nitrified, and although this action is speedy in normal soils, experiments have, we believe, shown that nitrate of soda affords a better source of nitrogen in certain cases. If manufacturers of synthetic ammonia direct their efforts to the production of ammonium compounds having such chemical properties and physical characteristics as will prove equal or superior to nitrate of soda under all conditions of application, it is certain that the demand for ammonium products will increase at the expense of nitrate of soda.

To what extent this process of displacement will operate depends largely on price considerations. It is known that the federated nitrate of soda companies

are devoting attention to the more efficient and economical extraction of nitrate from caliche, and it is not improbable that the outcome of this endeavour will be a cheapening of the price of their product. In any case, there is bound to be a healthy struggle between the undertakings producing the two fertilisers, but it is impossible to predict what the ultimate practice will be, although it is by no means unlikely that the future will see synthetic ammonia companies manufacturing nitrate of soda obtained by reaction between soda ash and nitric acid, the last-named being derived from the oxidation of ammonia by the Oswald process. It must not be overlooked that finality in the use of nitrogenous fertilisers has not yet been reached. India, for example, cannot yet absorb its own small production of sulphate of ammonia, but when one has regard to its large population and to the demand for a better standard of living by its inhabitants, it is obvious that here is a potential outlet for great and increasing quantities of nitrogenous fertilisers.

The Likelihood of New Applications

EVEN when all the foregoing considerations are taken into account it is apparent that the outstanding factor which will tend to limit the production of synthetic ammonia will be the carbonisation of coal, a process which is rapidly on the increase and from which by-product ammonia must inevitably be yielded. There is, in fact, no price so low as could lead to a stoppage of its production. When it is recalled that the ammonia content of synthetically-produced ammonium sulphate cannot cost less than £6 per ton to-day, and that the larger installations of the carbonising and coking industries realise about £4 per ton of ammonium sulphate for the ammonia content of their product, it is seen that unless there is some drastic improvement or economy in working costs of the synthetic process, the limiting factor governing the production of the synthetic product will soon be reached. Synthetic ammonia manufacturers have certainly an advantage to-day over by-product producers in that their ammonia is pure, whereas by-product ammonia is handicapped by the presence of impurities. Even, however, when this factor is considered, together with the cheaper method of converting synthetic ammonia into ammonium sulphate by the use of anhydrite, the difference in cost of converting the two qualities of ammonia into ammonium sulphate cannot be more than £2 per ton in favour of the synthetically-manufactured product.

Ammonia most certainly is the most interesting and complicated example of the far-reaching effects of the chemical revolution which the last ten years have witnessed, but it is reasonable to make the assumption that eventually it will provide no exception to previous experience with other substances, and that new applications will be found for any surplus above present requirements. We note from an American contemporary that confidence in the future in this respect is expressed, although it is felt that the synthetic output will undoubtedly continue to disturb prices until a new equilibrium is established. America, of course, has a great and growing coal carbonisation industry, and it is felt there that gas liquor ammonia—an involuntary and constant by-product—is a factor to be reckoned with, particularly in view of the chemical nuisance laws, which are as stringent as in this country. The conversion, however, of some of this ammonia into newer salts, particularly the chloride and the bichromate, for which some promising new uses are now being studied, will, it is thought, sooner or later relieve the pressure, while the announcement that at the largest synthetic establishment in America it is intended to convert part of the output to sal ammoniac and bicarbonate foreshadows a step in the right direction. Another suggestion is that gas liquor distillation should be centralised, thus effecting material economies over the present rather disjointed and parochial methods in vogue. This, however, is a policy which would require very close investigation, for transport costs, unless the liquor were concentrated at the point of production, might more than counterbalance the saving effected by bulk distillation.

Popularising Ammonium Sulphate

THE British Sulphate of Ammonia Federation may fairly be congratulated on its well-chosen methods of educating the British farmer and horticulturist in the right uses of artificial fertilisers. Its recently-started monthly journal, *Farm Notes*, edited by T. H. J. Carroll, not only keeps the agriculturist informed of the good results produced by the right use of nitrogen, but, what is equally important, warns him against wrong methods of use and against wasting time and money on comparatively worthless materials. The selected illustrations showing the striking contrast in results where ammonium sulphate is applied and where it is not, serve very well, with the attractive frontispiece, to supplement the letterpress.

Attention has been more than once drawn to the important results that are being attained by the application of sulphate of ammonia to crops grown in tropical countries. Here the scope for expansion is almost without limit, but the conditions of climate, soil, crops, and methods of cultivation are widely different from those of home agriculture, and require to be exhaustively investigated before advice can be offered as to the effects of the application of ammonium sulphate, or other types of artificial fertiliser. In this matter a valuable piece of service has been rendered by Mr. Carroll in the preparation of a series of five pamphlets—a little library in itself—containing notes on the cultivation and manuring of five important foreign-grown crops, namely, tea, coffee, cotton, rubber, and maize. In a small space each booklet gives just the essential information required respecting each crop and the kind of manurial ingredients best suited to its nutrition and development. While, of course, the admitted object is to show the advantages of a liberal use of nitrogen, and to emphasise the fact that in sulphate of ammonia nitrogen is found in its most convenient form, there is no attempt at an indiscriminate recommendation of sulphate. On the contrary, tables of tests are given which enable the cultivator to judge for himself to a large extent, and the advice offered, as to whether sulphate should best be used alone or in combination with other artificial manures so as to form a complete mixed fertiliser, varies with the crop and the local conditions. These

handbooks may be welcomed as useful technical manuals and as good examples of propaganda literature.

Synthetic Rubber Research

IN THE CHEMICAL AGE of December 26, 1925 (p. 643), it was stated that Wiebe and Konsorten, Hanover, Germany, had started manufacturing synthetic rubber from potatoes. It has been suggested that this probably refers to the isolation of isoprene from potatoes and their by-products and its conversion into a mass similar to crude rubber. This, however, can hardly be the case. Isoprene has been produced from two by-products of starch, namely, fusel oil and lactic acid, but these processes are at present uneconomical. The German firm are probably engaged in the preparation of dimethylbutadiene-rubber (the so-called methyl-rubber) which was commercially the most successful material prepared in Germany during the war. Dimethylbutadiene is readily obtained from pinacone and the latter from acetone :—$CH_3.CO.CH_3 \rightarrow (CH_3)_2COH.COH(CH_3)_2 \rightarrow CH_2 : C(CH_3).C(CH_3) : CH_2$.

The first process for the preparation of acetone by fermentation was due to Dr. Fernbach and was originally carried out on an industrial scale in England. During the war a modification of this process by Boettinger was successfully worked in Germany. Essentially, it consists in fermenting a suitably prepared potato mash with the aid of Bacillus Macerans, an organism found in rotting potatoes. Dimethylbutadiene is very readily polymerised to synthetic rubber. During the war the Germans achieved this by enclosing dimethylbutadiene in iron drums which were kept at 60° C. for from four to six months. The production of synthetic rubber both in the laboratory and on an industrial scale was first carried out in England, and the activity of continental firms should stimulate our manufacturers to fresh efforts to maintain their lead in this promising and highly important field.

New National Health Taxes

THIS is the first week in which the new National Health and Unemployment contributions apply. Persons previously insurable under the National Health Insurance Act are now also insurable under the Widows, Orphans and Old Age Contributory Pensions Act, and combined contributions for these will be payable by stamps affixed upon the same card. The new weekly rates of contributions in this respect are for male contributors 1s. 6d. and for female contributors 1s. 1d., of which the employer is responsible for paying normally 9d. and 7d. respectively. Such proportions apply not only to employers in connection with factory and office workers, but also for their domestic servants. At the same time, the new contributions payable under the Unemployment Insurance Acts come into force. For adult male workers the unemployment stamp now amounts weekly to 1s. 3d. and for female workers 1s. 1d., of which the cost to the employer is 8d. and 7d. respectively. A useful arrangement which should be noted is that the Postmaster-General will now exchange or take in part payment unused health and unemployment insurance stamps of the denominations which were in use up to January 4, 1926, for health and unemployment stamps of the new values. These exchanges will be permitted until January 31, 1926.

The Calendar

Jan.		
11	Institute of Metals (Scottish Section) : "The Mechanical Properties of Non-Ferrous Metals and Alloys at High Temperatures." Professor F. C. Thompson. 7.30 p.m.	39, Elmbank Crescent, Glasgow.
11	Worshipful Company of Dyers : "Artificial Silk Dyeing." C. M. Whittaker. 6 p.m.	Dyers' Hall, Dowgate Hill, London.
11	Ceramic Society : "The Scientific Treatment of Feed Water for Boilers." W. B. Lewis. "Chemical Stoneware." W. Green.	Central School of Science, Stoke-on-Trent.
12	Society of Chemical Industry (South Wales Section) : Discussion on "The Training of Chemists for Industry."	Technical College, Cathays Park, Cardiff.
12	Institution of Petroleum Technologists : "Edeleanu Process." Dr. L. Edeleanu.	Aldine House, Bedford Street, Strand, London.
13	Institution of Chemical Engineers : "A Critical Review of Published Experiments in Filtration." A. J. V. Underwood. "Tube Mill Grinding, with special reference to Grinding in a Current of Air." Dr. Geoffrey Martin.	Burlington House, Piccadilly, London.
13	Electroplaters' and Depositors' Technical Society : Discussion on Silver Plating. 8.15 p.m.	Northampton Polytechnic Institute (Room 118), St. John's Street, London, E.C.
13	Royal Society of Arts : Dr. Mann Juvenile Lecture : "Alice in Wonderland at the Breakfast Table." Professor H. E. Armstrong.	John Street, Adelph, London.
14	Institution of the Rubber Industry (Manchester Section) : "Steam and Its Control as Applied to Rubber Production Methods." H. C. Young.	Manchester.
14	Oil and Colour Chemists' Association : "Cellulose Nitrate Lacquers." A. E. Lain. "Leather Japanning." A. W. Lattey.	8, St. Martin's Place, Trafalgar Square, London.
15	Institute of Chemistry and Society of Chemical Industry (South Wales Sections) : "Modern Resistance Glasses." E. E. Ayling.	Technical College, Swansea.
15	Institute of Metals (Swansea) : "The Wire-Drawing Process." Professor E. C. Thompson. 7.15 p.m.	University College, Singleton Park, Swansea.
18	Institute of Chemistry (Manchester Section) : Discussion on "Chemical Nomenclature," to be opened by C. Hollins.	Manchester.
18	Institute of Chemistry (Manchester Section) : Discussion on "Chemical Nomenclature," opened by C. Hollins.	Manchester.
18	Faraday Society : Ordinary meeting. 5.30 p.m.	Burlington House, Piccadilly, London.
19	Hull Chemical and Engineering Society : "The Application of Physics to the Paint and Varnish Trade." A. de Waele. 7.45 p.m.	Grey Street, Park Street, Hull.
19	Institute of Metals (N.E. Coast Section) : "The Principles which Govern the Heat Treatment of Non-ferrous Alloys." Professor F. C. Thompson. 7.30 p.m.	Armstrong College Newcastle-on-Tyne.,
19	Society of Chemical Industry (Birmingham and Midland Section) : "Early Days of the Rubber Industry." B. D. Porritt. 7.15 p.m.	University Buildings, Edmund Street, Birmingham.
19	Royal Institution : "X-Rays and Living Matter." James A. Crowther. 5.15 p.m.	21, Albemarle Street, London.
20	Leicester Literary and Philosophical Society (Chemistry Section) : "The Development of Physical Science in the Last Forty Years." E. E. Brooks. 8 p.m.	Museum, New Walk, Leicester.
20	Society of Glass Technology : 2.30 p.m.	Manchester.

Manufacture of Hydrogen for Industrial Purposes

Chemical Engineers' Conference in London

On Friday, January 8, a conference of the Chemical Engineering Group of the Society of Chemical Industry at Burlington House, Piccadilly, discussed from various aspects the important problem of the production of hydrogen for industrial purposes. We give below summaries of the papers on "Hydrogen for Hydrogenation of Oils" by A. Edgar Knowles and "The Production of Hydrogen by Micro-organisms" by Dr. A. C. Thaysen.

Hydrogen for Hydrogenation of Oils

By A. Edgar Knowles

MANY processes have been suggested and tried out, but to-day there remains only one process which has stood the test of time—viz., the electrolytic decomposition of water. Given cheap suitable fuel, the Haber-Bosch process used by the Badische Anilin and Soda-Fabrik in the manufacture of synthetic ammonia is the cheapest method of producing hydrogen on a large scale, but the hydrogen, on account of the large percentage of nitrogen it always contains, is quite unsuited for hydrogenating oils. This process consists in passing a mixture of water-gas and superheated steam under pressure over a catalyst which converts the carbon monoxide into carbon dioxide, giving up an equal volume of hydrogen. The hydrogen produced therefore is roughly equal in volume to the water-gas used. The carbon dioxide is removed by solution in cold water. The product always contains a varying amount of carbon monoxide, which would require removal as well as the nitrogen before such gas would be suitable for hydrogenation of oils.

The Lane steam-iron process was largely used in the early days of hydrogenation of oils. Carefully operated, this plant

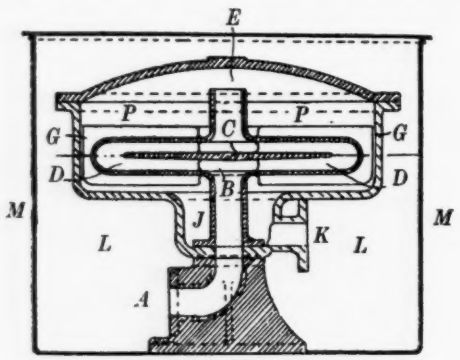


FIG. 1.—KNOWLES FURNACE.

A.	Gas inlet pipe.	G.	Outer chamber.
C.	Baffle plate.	K.	Gas outlet pipe.
E.	Top of chamber.	M.	Outer case.
F.	Catalyst.	L.	Lagging.

produced high quality hydrogen. Even so, the traces of carbon monoxide and sulphur compounds remaining affected the hydrogenation process, and where we had the process working side by side with the electrolytic process there was a marked difference in the speed of hydrogenation, materially affecting the output of the hydrogenation plant. This process consisted in first passing steam through retorts containing heated iron, preferably a carbonaceous iron ore such as was obtained at Silverdale, Staffordshire. The iron was oxidised in this operation and hydrogen produced. Water-gas was then passed through to reduce to iron again. In practice about five times as much water-gas was required as hydrogen produced. Many modifications in the type of plant and in operating the process were tried, but the ultimate result of years of working was that the hydrogen cost was high, not only on account of the fuel and labour costs but of the heavy cost of maintenance. This process has now been almost completely abandoned for the hydrogenation of oils.

The Linde process was also tried on a large scale, but has, I believe, been completely abandoned. This was the separation of hydrogen from water-gas by liquefaction. Practically the whole of the hydrogen in the water-gas was obtained, so that the consumption of water-gas was little more than double the hydrogen produced. The by-product carbon monoxide was used in a gas engine to produce the power required for operating the compressors. But it was difficult to remove the last of the carbon monoxide, and the product was inferior in this respect to Lane hydrogen. Also, the presence of large volumes of odourless, almost pure, carbon monoxide was a menace to the operators, which was seriously against the adoption of this method, although I never heard of a fatality from this source. The capital cost of the plant was high, particularly for the comparatively small units called for in oil hydrogenation, and more highly skilled labour required in the operation and maintenance than by other methods, so the hydrogen costs were more than by the electrolytic process under the usual conditions of operating hydrogenation plants.

Factors in Cost

In considering the cost of electrolytic hydrogen one of the most important factors is that the by-product oxygen is usually a valuable asset. Generally the quantity of oxygen is sufficiently large to be worth compressing and selling, and seldom is it so large that there is difficulty in disposing of the whole output. In many cases this product has been purchased in bulk by one or other of the established oxygen supply companies, and in at least one case the price received for this by-product from the local oxygen supply company left a clear profit on the entire cost of running the plant and the charges for interest and depreciation on the whole outlay, so that these works were in the happy position of being paid to make the hydrogen which they were themselves using for the hydrogenation of oils.

Another factor peculiar, of course, to most electrolytic processes is that the main item of cost—electricity—is the same for all capacities of plant, the production always being in the proportion 1 cubic metre of dry hydrogen at 0° C. and 760 m/m pressure for 2403·0126 ampere hours. A well-constructed modern type of cell has no measurable internal leakage of current and no gas leakage, and can be relied upon to give this figure. The ampere hour capacity, and therefore the output of gases at constant temperature, is approximately 1 at 2 volts per cell, 2 at 2·25 volts per cell, 3 at 2·5 volts per cell—the power consumed per cubic metre produced being in the proportion of the voltage—with cells running at 2 volts 4·806 K.W.H. will be required per cubic metre of dry hydrogen at N.T.P.; at 2·25 volts 5·407 K.W.H., and at 2.5 volts 6·007 K.W.H. The capacity of a multipolar cell is in direct proportion to the number of electrodes less one (the outside electrodes have the inside surfaces only effective). It follows, therefore, that the cost of cells at any particular voltage is practically in direct proportion to the output. The two main items of cost, electricity and interest and depreciation on outlay, will therefore be almost the same for small outputs as for large outputs for any particular voltage per cell and with the same charge for electricity.

In the latest types of plants the gases are washed by the fresh distilled water going to the cells and the feed is automatically controlled, requiring no labour. The total labour required is therefore very small and the caustic soda or potash used for the electrolyte is negligible.

The consumption of distilled water averages about 10 per cent. above the theoretical. It has been claimed that undistilled water can be used, but no chemist will believe such an absurd statement. All impurities in the water remain, and will accumulate in the cells, quickly increasing the internal resistance, and where the water contains chlorides causing corrosion and destruction of the positive electrodes which nickelling only retards but does not prevent.

Finally the product is practically 100 per cent. hydrogen direct from the cells, and cannot contain any catalyst poison.

With regard to the electrolytic plant itself, the first improvement to be introduced was in the purification of the gases. Siemens-Schuckert used a silver tube containing palladium-pumice heated in an electrical furnace. This was fairly effec-

tive with low quality products, but used a considerable amount of electricity and the tubes frequently burnt out and were expensive to replace. It was ineffective with high quality gases.

The arrangement shown in the accompanying drawing (Fig. 1) was then introduced. The incoming gas was preheated by the outgoing gas and the palladium-pumice was spread over a large area through which the gas was bound to pass. This apparatus proved completely satisfactory. Electricity for heating was only required when starting cold, after which it maintained sufficient temperature to completely remove the impurity.

Garuti and Pompili had introduced a perforated plate as a diaphragm to keep the gases separate in the electrolyte. Siemens-Schuckert kept the electrodes short and spaced well apart and operated without a diaphragm. Dr. Schmidt (Oerlikon) used asbestos sheet, but as at that time that would not stand caustic he used carbonate of potash for the electrolyte to give life to the diaphragms. A specially woven fine steel gauze has been found much more effective as a separator and in practice has run for ten years without being replaced. Later, however, improved woven asbestos cloth was used, as is present practice. This material keeps the gases apart so effectively that to-day no subsequent purification is necessary. Curiously it lowers the resistance of the cell. But most important of all, it avoids completely a danger always present when metallic diaphragms are used—the possibility of the diaphragm becoming polarised and thus generating mixed gases on one side of this separator. This danger is a very serious one with batteries running at high voltage on cheap electricity.

Fig. 2 is a diagrammatic drawing of the automatic feed, showing how the gases are washed with the distilled water going to the cells, removing the caustic spray from the gases and returning it to the cells, so that the loss of caustic is negligible when running.

The first plant built (1910–11) at Bromboro' for supplying the oil hardening plant of Lever Bros., consisted of 200 cells in series on a 440 volt circuit and with 2,000 to 3,000 amperes passing through each cell. For many years these were the heaviest current cells in existence. To-day 200 cells are running at Bussi in Italy at up to 7,200 amperes through each, and 600 cells are being built at Pierrefitte in the French Pyrenees to pass continuously 7,500 amperes each—but these are for synthetic ammonia; such large plants have never been called for in connection with the hardening of oils.

By-Product Oxygen and Hydrogen

The enormous size of electrolytic plants in connection with synthetic ammonia, with their immense output of by-product oxygen on the one hand and consumption of electricity on the other hand, intensifies problems already touched upon in their connection with hydrogenation of oils. In the early development of oxy-acetylene welding and cutting, it was the demand for higher quality oxygen than could be produced by any other process which led to its electrolytic manufacture. No value was placed on the by-product hydrogen, because the demand was then very limited. It is common experience, however, in chemical work that if one makes a purer product or a cheaper product, a demand quickly develops. In this case a demand arose—which at that time seemed a very large one—for this hydrogen in the manufacture of electric lamps, and before three years were out came the big contracts with Lever Bros. for oil hardening, which necessitated the re-designing of the electrolytic plant on a totally different basis (the development of the heavy current cell) and completely reversed the position of the products—hydrogen becoming the main product and oxygen the by-product. It was not long, however, before the lowering of the prices of oxygen and the improvement in the quality increased the demand so many times that the whole output was absorbed. To-day the position is again that the demand for electrolytic hydrogen is so great, particularly for synthetic ammonia, that at several plants immense quantities of oxygen are being wasted, and therein lies an opportunity for further research. These ammonia works are generally in isolated places to obtain cheap hydro-electric power, hence away from an industrial area where there is a demand for oxygen. The cost of compression and transport in cylinders is prohibitive. It might be and probably will be conveyed by pipe lines under pressure, but the ideal is some large use for it at the source. Many minds are working on the problem at present, as with it is bound up the further extension of the use of pure electrolytic hydrogen in other synthetic processes such as alcohol, petrol, etc., which now appear to be getting near the practical stage.

Next as to the cost of electricity. Unlike most electrochemical processes, the electrolysis of water does not require constant voltage or constant amperage. They can be varied within wide limits. Further, the plant can be shut down or started up instantly on the switch.

This feature is of great importance. I have referred to the plant put in at Bussi in 1923. This adjoins one of the hydro-electric power stations supplying Naples 190 kilometres away with power, and is being run on the " off-peak " load, using some of the water which would otherwise pass over the falls and be wasted. The cells are standard cells of 26 electrodes passing 4,166 amperes at 2·25 volts each, 6,250 amperes at 2·50 volts each, and are overloaded for short periods each day to 7,200 amperes at 2·60 volts each. The load varies during the day from 1,800 amperes to 7,200 amperes, and averages 5,400 amperes.

Obviously the cost of electricity under such circumstances

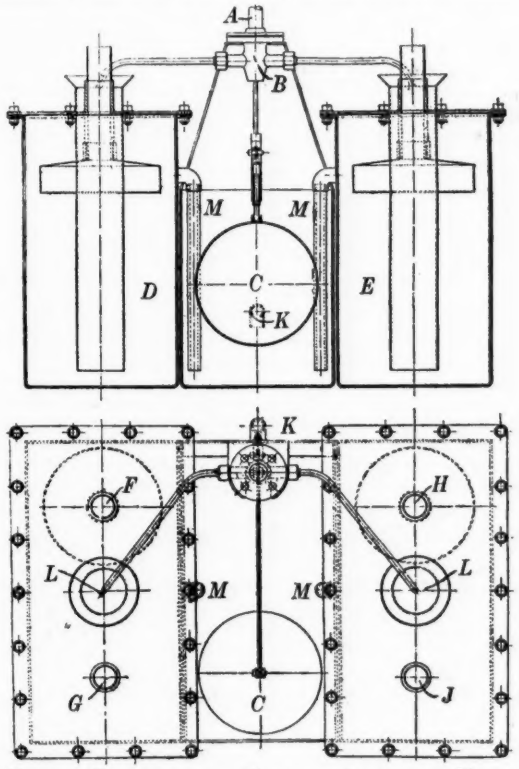


FIG. 2.—DIAGRAMMATIC VIEW OF AUTOMATIC FEED.

A.	Distilled Water Inlet.	G.	Oxygen Outlet.
B.	Piston Valve.	H.	Hydrogen Inlet.
C.	Ball Float.	J.	Hydrogen Outlet.
D.	Oxygen Washing Tank.	K.	Distilled Water Outlet to Cells.
E.	Hydrogen Washing Tank.	L.	Water Inlet to Washing Tank.
F.	Oxygen Inlet.	M.	Overflow Pipe to Centre Tank.

is very low : the extra water costs nothing, the extra labour and wear and tear on plant is negligible, and there is no additional capital outlay at the generating station.

Briefly summarising, my conclusions are :—(1) That pure electrolytic hydrogen should always be used for hydrogenating oils. (2) The cost will vary in each case—no two plants are alike—and this will be based upon : (*a*) the price at which electricity can be purchased under the conditions referred to which are unusual and favourable to exceptionally low figures ; and (*b*) the value of the by-product oxygen. These two points have to be thoroughly investigated before even the best voltage at which to run the plant can be settled. The problem is to find the lowest combination of cost of electricity plus interest and depreciation on capital cost of plant—the one increasing as the other decreases, but in proportions varying according to price of electricity and cost of plant. Whatever

type of plant is adopted, practically the full theoretical figures given earlier in the paper can be obtained, and anything less indicates internal leakage of electricity, which is not only unsafe but liable to cause varying quality of the products.

The Production of Hydrogen by Micro-Organisms

By Dr. A. C. Thaysen

THE author stated that in recent publications by Szent-Györgyi and Kluyver and Donker evidence had been brought forward which reconciled Wieland's and Warburg's theories on the chemistry of respiration, and these were reviewed in detail. The inquiries showed that hydrogen might be produced by the action of micro-organisms either from sugars, starch, or cellulose. Industrially, however, where the production must compete with non-biological methods only such methods of hydrogen fermentations could be considered where the gas was a waste product in the manufacture of other substances. So far only one fermentation process was known where this was the case. This process, which owed its success to the world war, was evolved chiefly to supplement the available inadequate methods of acetone production. Now it had become of more lasting importance owing to the value of the butyl alcohol formed as an additional fermentation product. To-day the fermentation of starch for the production of butyl alcohol was a flourishing industry in countries where cheap raw materials were available in the form of starch and sugar.

The bacterium used in this process belonged to the Amylobacter group. According to Reilly and his colleagues the starch was converted into a mixture of 10·77 per cent. of acetone, 25·07 per cent. of *n*-butyl alcohol, 62·61 per cent. of carbon dioxide, 1·60 per cent. of hydrogen and 1·80 per cent. of organic acids. In other words, 1 lb. of maize fermented yielded, in addition to the other fermentation products mentioned, 5·5 cu. ft. of hydrogen gas. When it was considered that the daily consumption of maize or other starch containing raw material in a comparatively small plant was at least 20 tons, equal to a production of one quarter of a million cubic feet of hydrogen, it would be realised that this industry constituted a by no means unimportant source of hydrogen. Work done at the Royal Naval Cordite Factory during the war showed that the hydrogen could be readily separated from the carbon dioxide with which it was originally mixed. The hydrogen thus separated was of very high purity and was free from nitrogen and other undesirable admixtures. Being entirely a waste product its cost of production was, practically speaking, limited to the cost of its collection and purification. Data collected in this respect during the war would appear to indicate that 1,000 cu. ft. could be produced for one shilling.

As already mentioned no other micro-biological process existed which could compete with the butyl alcohol fermentation in the production of hydrogen. But it was conceivable that, should the strenuous efforts now being made to utilise waste cellulosic material for the production of power alcohol finally be crowned with success, these might in this fermentation process become available and equally cheap and an even more abundant source of hydrogen.

Safety in Mines Research

A PAPER on "The Limits of Inflammability of Firedamp and Air," by M. J. Burgess and R. V. Wheeler (Safety in Mines Research Board Paper No. 15, H.M. Stationery Office), has just been published, and the chief findings are that a marked effect on the limits is produced by the direction that the flame can take. The widest range of inflammability occurs during upward propagation of flame and the narrowest during downward propagation, while for horizontal propagation the values are intermediate.

The presence of water-vapour in the atmosphere does not appreciably affect the lower limit of inflammability. The reduction of the oxygen-content of the air narrows the limits. If it is brought about by the addition of carbon dioxide the limits are narrowed more rapidly. The effect of the presence of another combustible gas is dependent on the nature of that gas.

Storage of Benzol Wash Oils

DIFFICULTIES have from time to time been experienced in the storage of benzol wash oils, owing to the fact that these oils apparently possess the power of corroding lead. The suggestion has frequently been made that such corrosion was due to the impurities originally in the gas, that had been removed by the oils, such as cyanogen, ammonia, and sulphuretted hydrogen. To determine which of these theories is the correct one, two German chemists have recently concluded an investigation using for their experiments fresh benzol wash oil, water-free anthracene oil, an aqueous phenol solution, an alcoholic phenol solution, pyridine, and a solution of naphthalene in xylol. Lead plates were boiled in the solutions for 37 hours, and also treated in the same solutions for 100 hours at room temperature and free from air. It was found that the lead plates lost about 5 per cent. of their weight in the fresh wash oil, 1 per cent. in the used oil, 2 per cent. in the anthracene, while the phenol, pyridine, and neutral oils were without effect.

Though these results are experimental, they indicate without doubt that lead is strongly attacked by fresh wash oil, though the neutral oils, such as the naphthalene dissolved in xylol, have no corroding effect. The result obtained with pyridine does not permit of any very definite conclusion, because of the presence of the homologues of the basic and acid constituents in tar oil, whose combined action gave rise to different results. It may be rather surprising that the lead was more corroded by the fresh wash oil than by that which had been used to wash the gas. This is accounted for by the fact that when the used oil was tested, a thick film of lead sulphide was found which acted as a protection against other corrosive influences. This coating of lead sulphide was, in fact, so adherent that it was impossible to remove it without taking off part of the lead itself.

Alleged False Description of Sulphur

THE case in which Robinson Brothers, Ltd., of Stephenson Place, Birmingham, had been summoned before the Croydon magistrates for selling flowers of sulphur to which an alleged false trade description had been applied (THE CHEMICAL AGE, December 19, 1925) was on the list for hearing at Surrey Quarter Sessions at Kingston on Tuesday.

The Chairman, addressing the Grand Jury, said the charge was brought under the Merchandise Marks Act, and the case was that an official of the London Chamber of Commerce purchased from Robinson Brothers 2 cwt. of flowers of sulphur, and it was alleged that the article supplied was not flowers of sulphur but what was known as ground sulphur, which, according to the prosecution, was a very different thing. Flowers of sulphur was used for getting rid of mildew disease in hops, and was a specially prepared form of sulphur. Its price was £14 to £16 a ton, whereas ground sulphur cost only £8 10s. a ton.

Mr. Blundell, who prosecuted, asked for an adjournment in order that the prosecution might apply to a divisional Court for a writ of certiorari to transfer the case to the High Court.

A true bill having been found by the Grand Jury, the case was adjourned to the next Quarter Sessions, and it was stated that in the meantime an application might be made for the case to be heard in the High Court.

New District Members of Institute Council

THE following have been returned as district Members of Council of the Institute of Chemistry, to take office at the annual general meeting on Monday, March 1, 1926:—

Birmingham and Midlands—C. A. F. Hastilow; Bristol and South-Western Counties—F. Southerden; Liverpool and North-West Coast—H. J. Evans; London and South-Eastern Counties—E. M. Hawkins; Manchester and District—S. E. Melling; North-East Coast and Yorkshire—Dr. L. G. Paul; Edinburgh and East of Scotland—Dr. L. Dobbin; Glasgow and West of Scotland—W. H. Coleman; Wales and the County of Monmouthshire—C. A. Seyler; Northern Ireland—J. H. Totton; Irish Free State—Dr. W. R. Fearon; The Overseas Dominions, Empire of India, and Abroad—Dr. Frankland Dent.

Nitric Acid Production by the Submerged Brunler Flame

By Oscar Brunler

We give below some notes relating to nitric acid production by means of the submerged Brunler flame, some account of which has previously been published in THE CHEMICAL AGE.

THE internal combustion boiler, which was described in THE CHEMICAL AGE of February, 1925, can be applied advantageously in the chemical industry for a good many purposes. The internal combustion boiler is based on the principle of burning an open oil, gas, or powdered fuel flame in direct contact with water or chemical liquors which have to be evaporated and thus concentrated. Besides obtaining the highest thermal efficiency and reducing the costs for the concentration of the chemical liquors considerably, the Brunler flame can be used for the manufacture of nitric acid.

Calcium nitrates, sodium nitrate, and different kinds of so-called artificial manure are in great need for agriculture and the increase of production of farm produce. In different countries various processes are used for the manufacture of the above-mentioned manures. The question of reducing the cost price has always been of great importance. Since this is the most important point the question remains—Is it possible to manufacture calcium nitrate by means of the submerged flame, and is the manufacturing price less than by the present processes? It has been found that nitric acid or calcium nitrate can be manufactured on a large scale by burning an open flame in water or lime water. The results which have been obtained are given in this article.

The apparatus used for manufacturing calcium nitrate is shown in Fig. 1. The fuel, either oil or gas, and the air necessary to support the combustion are supplied to the pilot lamp and to the main burner under a pressure which barely exceeds the boiler pressure. In addition to the quantity of air theoretically required for combusiton an excess of air or additional oxygen is given. Before starting, the water level in the steam generator is lowered to the lower outlet of the burner, the cover of the pilot lamp is removed, and the fire clay lining is heated to red heat by any suitable method. The combustible mixture of oil and air, or gas and air, is blown against the fire clay lining and ignites. As soon as the flame burns in the pilot lamp, it is closed and the flame makes its way to the main burner. After a few minutes the main regulating valve is opened; the flame burns in the generator and is submerged in the water.

The results obtained and the different quantities of oil, air, and oxygen used were the following: During the first hour 30 kilos of oil were burnt, and for the combustion of these 30 kilos of oil 60 cub. metres of oxygen and 120 cub. metres of air were used. Since the air contains approximately 21 per cent. of oxygen and 79 per cent. of nitrogen, therefore the mixture ratio was—

85 cub. metres of O = 47 per cent.
95 cub. metres of N = 53 per cent.
30 kilos of oil.

The amount of nitric acid in 1000 c.c. of gas varied between ·0097 and ·0151 grammes. During the second hour the oil consumption was increased to 60 kilos per hour and 60 cub. metres of oxygen and 230 cub. metres of air were used. The pressure was increased from 0 to 14 lb. per square inch gauge pressure and was kept constant. 1000 c.c. of gas contained ·0189 to ·0195 grammes of HNO_3.

During the third hour the same oil, air, and oxygen quantities were used as before, but the pressure was increased to 21 lb. per square inch. 1000 c.c. of gas contained ·0226 to ·0333 grammes of HNO_3. During the fourth hour oil, air, and oxygen were as before, but the pressure was increased to 28 lb. per square inch. 1000 c.c. of gas contained ·0302 to ·0390 grammes of HNO_3. At 35 lb. per square inch pressure, oil, air, and oxygen as before, 1000 c.c. of gas contained ·0315 to ·0529 grammes of HNO_3. At 56 lb. pressure oil, air, and oxygen as before, 1000 c.c. of gas contained ·0657 to ·0815 grammes of HNO_3.

The above results have shown that 1000 c.c. of gas contained at 56 lb. per square inch working pressure at least ·0657 grammes of HNO_3. The total quantity of gases amounted to 60 cub. metres of O and 230 cub. metres of air = 290 cub. metres = 290 × 1000 c.c. of gases. Reckoning with an output of HNO_3 of ·0657 grammes per 1000 c.c. of gas, then the total quantity of HNO_3 produced by the combustion of 60 kilos of oil and 290 cub. metres of combustion air amounts to 290000 × ·0657 = 19,053 grammes = 19·05 kilos of HNO, per hour.

In England the B.T.U.'s in oil are more costly than in gas. therefore it would be advisable to burn gas instead of oil.

From the above results it will be seen that the weight of the combustion air and oxygen amounts to (60 × 1·3) + (230 × 1·2) = 354 kilos per 60 kilos of oil used, and 354 kilos of combustion air and oxygen produced 19·05 kilos of HNO_3 or 18·6 per cent. of the weight of the combustion air is transferred into HNO_3.

These results, obtained with the Brunler flame, show that the output of HNO_3 increases with increasing boiler pressure and for this reason commercial plants must be designed for

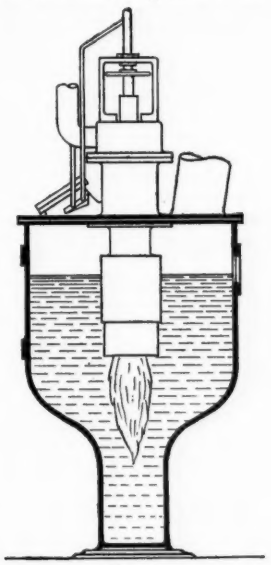


FIG. 1

high pressures in order to get the best possible results. Working at a pressure of 56 lb. per sq. inch approximately, 4 per cent. of the weight of the combustible mixture supplied to the boiler is the amount of nitric acid produced.

It is probably not too high to base the following calculations on an output of 5 per cent. of HNO_3 per kilo of combustible mixture, considering a plant working at 200 lb. per square inch boiler pressure, assuming 1000 cub. metres of gas per hour to be used for manufacturing nitric acid. This quantity of gas requires for complete combustion and for the production of nitric acid 5500 + 910 = 6410 cub. metres of air. Then the total weight of the combustible mixture is (6410 × 1·3) + (1000 × ·5) = 8830 kilos approximately, 5 per cent. of the total weight of 8830 kilos being 441 kilos of HNO_3.

Besides obtaining 441 kilos of HNO_3 the following power is produced: 1 cub. metre of the gas produces 12·5 kilos of steam gas mixture, 1000 cub. metres produce 1000 × 12·5 kilos = 12500 kilos of steam gas. A modern steam engine requires 6 kilos of steam gas per horse power per hour. Since 12500 kilos of steam gas are produced, therefore $\frac{12500}{6} = 2090$ h.p. is the power gained in burning 1000 cub. metres of gas.

The price for 2090 h.p. would be the costs of 1000 cub. metres gas, from which has to be deducted the value of 441 kilos of nitric acid, which represent a value of about £4, if the nitric acid is neutralised by lime and is sold as calcium nitrate for manure purposes.

These figures show that calcium nitrate can be produced very economically as a by-product in burning a flame submerged in lime water.

"A Chance for Industrial Oxygen"

To the Editor of THE CHEMICAL AGE.

SIR,—With regard to your leader under the above heading in your journal of January 2, may I be allowed a little space to put before your readers a method of obtaining cheap oxygen, which for some time past I have been pressing upon power-station engineers.

To-day the demand for electrolytic hydrogen for synthetic ammonia and other processes is leaving an enormous volume of oxygen, which at the present time is for the most part being wasted. This waste is of practically pure oxygen. Unfortunately, these plants are nearly all being installed at hydro-electric stations where cheap electricity is obtained, and these stations are away from industrial areas. For some time past I have been impressing upon power-station engineers that there is a great opportunity here in connection with steam plants, and a few days ago I had the pleasure of discussing the matter seriously with the principals of one of the big steam super-power stations. These stations have anything from an average of 30,000 to 100,000 KWH available as off-peak load, and at this interview I was informed that they had gone into the matter very carefully and they could supply this off-peak load at one-third of the minimum price which they were now supplying in bulk. In actual figures, the price proposed was 2/10ths of a penny per unit.

Now hydro-electric stations supplying power for making hydrogen for synthetic ammonia generally charge 1/10th of a penny, so that if 1/10th of a penny can be covered by the surplus oxygen, it is quite feasible to make synthetic ammonia, using the current from a steam plant, and so bringing the industry into an industrial area instead of in an out-of-the-way place. This would suggest that it is within the range of practical politics to build ammonia plants in London or other big towns, taking the off-peak load from one or more of the big power-stations, using that to produce electrolytic hydrogen and oxygen, and give the oxygen which you refer to at about the figure stated for the purpose of gas making or some other process requiring very large quantities of absolutely pure oxygen at a very low price.—Yours, etc.,

A. EDGAR KNOWLES,
Chairman of the International Electrolytic Plant Co., Ltd.

Chester, January 4.

Fine Chemicals at the B.I.F.

To the Editor of THE CHEMICAL AGE.

SIR,—We should like to draw your attention to the fact that the name of Boots Pure Drug Co., Ltd., was omitted from the list of exhibitors published in THE CHEMICAL AGE on January 2.

As we are making a comprehensive display at the British Industries Fair, it would probably interest your readers to know that Boots Pure Drug Co., Ltd. intend this display to illustrate the rapidly expanding importance of its trade in fine chemicals, pharmaceutical and therapeutic substances. Special attention will be given to a section devoted to research chemicals of guaranteed British manufacture and purity.—Thanking you in anticipation, Yours, etc.,

BOOTS PURE DRUG CO., LTD.
D. ELEY, Publicity Manager.

Nottingham.
January 4.

B.A.C. and Registration

To the Editor of THE CHEMICAL AGE.

SIR,—The British Association of Chemists has noted with interest the letter over the signature "F.I.C.," which appeared in your issue of January 2.

In the first place it is necessary to make it clear that the Association favours the second alternative suggested by your correspondent, namely, that as a preliminary measure all who have a right to professional recognition—and many at present without paper qualifications have such a right—shall be included in the register, but that when this has been done entry into the profession shall be regulated by the conventional method, that of academic qualification.

The Association disagrees with the view that the doctor serves a larger section of the public than does the chemist, and the opinion is indeed manifestly fallacious. There is no industry of national importance to the welfare of which the services of the chemist are not essential. There is no member of the community who does not depend upon the chemist, no less than upon the doctor, for his well-being, his common safety, and indeed his very life. The fact that the public does not fully realise this makes the argument for registration the stronger. It is, in fact, through organisation of their own profession that the doctors—once in no greater esteem than the chemists are to-day—showed the public how vitally bound up with its own interests was a rigid standard of professional qualification.

It is further asserted, having regard to the fact that the large majority of doctors are in private practice while the greater number of chemists are employed, that there is a fundamental distinction between the two professions. It is one, however, which is purely artificial. Both are, in fact, employed, the one directly by the public, the other indirectly. It is true that the employer can appoint whom he will to do his work, but the public is also free to employ the quack. That, however, is an argument for, not against, registration. It is the "close" medical profession which has discouraged and made the quack unpopular. There is no law to prevent his being employed. It is probable that, under chemical registration, in ten years' time no employer without considerable difficulty could discover an unregistered chemist to employ. Chemistry, unlike medicine, would furnish no fruitful field for quacks. Medicine, never exact in its effect, is not infrequently a source of profit, where chemistry would be none.

In conclusion, it is difficult to believe that "F.I.C." seriously advances the thesis that the present register of the Institute of Chemistry, excellent though it is, can be said to meet the needs of the expression "some form of registration."—I am, etc.

HY. T. F. RHODES,
General Secretary, British Association of Chemists.

175, Piccadilly, W.1.
January 5.

"Chromium and Protective Coating"

CHALAS AND SONS, Finsbury Pavement House, Moorgate, London, write:—

"In your issue of January 2 (Metallurgical Section, p. 5), in an article on 'Chromium and Protective Coating' you point out that chromium is one of the metals approaching exhaustion and that this is to be regretted on account of its valuable properties. As we have supplied the bulk of the trade from Africa, India, and New Caledonia during the last 25 years, we beg to point out that, given a proper and definite demand, the companies for whom we act can supply any quantity which is likely to be wanted. We think this information will be of value to those who are interested in developing the uses of chromium."

A Retiring Chemical Merchant's Lament

ACCOMPANYING the official announcement that the firm of Hollinghurst and Co., Ltd., chemical merchants, is about to be dissolved, is a circular letter from the managing director and principal shareholder, in which (*The Times* states) the burdens that are to-day laid upon business are denounced in unsparing fashion. Mr. Hollinghurst, after making it clear that the liquidation is a voluntary and personal matter, says he has formed the opinion that there is an entire lack of encouragement on the part of the Government towards the trader—whether manufacturer or merchant. The British trader of to-day, he declares, has practically developed into a taxation collecting agency for the Government, which takes an enormous percentage of the results of his labours in good times, and thus deprives him of a chance of providing for the "rainy day," and, adds the writer, "it is at present raining very hard." It would be regrettable if this gloomy picture of the present-day trader's lot were to persuade into retirement others whose claim to withdraw from business were less well established than that of the writer of the letter. As a reminder, however, of the way in which enterprise is discouraged by burdensome taxation the protest of this City merchant deserves notice, for he is echoing a sentiment that is shared by a very large proportion of the business community.

London Discussion on "Coalescence"

Practical Problems still Unsolved

At the meeting of the London Section of the Society of Chemical Industry on Monday, Mr. C. S. Garland in the chair, Mr. A. V. Slater read a paper on "Coalescence." He introduced his subject by referring to his recent paper on peptisation, which he said was simply dispersion of agglomerates of colloid particles. Peptisation was caused by the solution pressure exerted by the added substance. An extension of the well-known laws of dissociation was all that was necessary to account for colloid phenomena. It then became necessary to consider, when colloid particles got close together, whether they coalesced or not. Coalescence excluded condensation and crystallisation, owing to surface escaping molecules; it was the process that resulted from that proximity of surfaces which permitted surface molecules to be within the range of molecular attraction without actual detachment from the surface. Although it was caused by molecular attraction it proceeded most rapidly when this was not a maximum, and liquids exhibited the phenomenon most readily. Plane surfaces theoretically required time for coalescence, while spheres were independent of time. The heat motions of the molecules determined whether coalescence was spontaneous and it was entirely dependent on the molecules moving normal to the surfaces. Solids coalesced only when an external force or increased temperature effected the regional orientation of the molecules so as to offer the maximum attraction, by permitting them to assume rotational movement. Solids usually had an adsorbed film of fluid and if this was thick enough the films might coalesce. The most stable emulsions were those having solid films of emulsifier around the globules of minimum thickness, and the best emulsifiers were those having a crystallising force greater than the surface tension forces. Ageing of jellies and precipitates was due to surface migration and not to coalescence. Solid-solid contact never occurred in settlements, and compact settlement was prevented by a mild flocculant, which increased the liquid held by the particles. The elasticity of jellies was due to molecular movement being restricted in some directions.

Discussion

The Chairman (Mr. C. S. Garland) asked whether the author regarded colloid sizes as a constant quantity or whether the colloid size varied for the same material in different media. Another point was with regard to puddled starch. When starch was put under pressure a solid material was obtained which could be broken, and formed distinct cleavages. When it was allowed to stand for a while it ran down into a liquid mass; when put under pressure it became solid again. That seemed to him to be the opposite to what might be expected.

Dr. W. R. Ormandy, speaking on the properties of extremely finely ground materials, said that a German firm were now making steatite sparking plugs by using extremely finely ground steatite under pressure. In this way they avoided the expensive process of turning the sparking plugs from the solid and obtained perfectly satisfactory insulating properties. This process was the result of the discovery that very finely ground materials would stick together at a temperature far below the melting point, and finely ground steatite, by this process, gave perfectly gas-tight plugs.

Dr. Geoffrey Martin said that the problems of coalescence had very important industrial applications in many directions, particularly in the cement industry. Cement slurry, for instance, had to be pumped very often through pipes for long distances and the quantity of water had to be adjusted within very fine limits to facilitate these pumping operations and to reduce the horse power required. Whilst these facts were known, however, there seemed to be no satisfactory explanation of the reasons. Another problem which affected cement manufacture was the transport of powdered coal through pipes. Powdered coal was the bane of the lives of those engaged in cement works because the quantity of moisture in the powdered coal to be transported through the pipes had to be adjusted within very fine limits, and if it were much above 5 per cent. then the particles would not flow. Another difficulty was that the presence of extremely small traces of impurities would enormously reduce the adhesive effect; experiments had shown that a small quantity of sugar in cement had this effect. There was no reference to this matter in the text-books and much more information was needed about it.

Mr. R. H. Pickard disagreed with the author in saying that liquids coalesced more easily than solids. He had noticed in boiling liquids in reflux condensation processes, such as the preparation of an ester, and also in driving off liquids for dehydrating agents, that the drops falling off from the condenser often raced about on the surface of the liquid for a considerable time and did not immediately unite with the mass. He had also noticed, in filtering oils, that the degree of inclination of the walls of the measuring cylinder considerably influenced the manner in which the drops of oil joined up with the general mass. Sometimes the drops of oil would bounce off like a shot. He was at a loss to understand these things and would be pleased to have some information about them.

Mr. Slater briefly replied, and the Chairman, proposing a vote of thanks to him, expressed the hope that further results of his investigations would be placed before the Society.

German Synthetic Methanol

Comments on Fluctuating American Imports

The decrease in imports of German synthetic methanol, which it had been feared would destroy America's $100,000,000 wood distillation industry, is mystifying American chemists, according to Dr. E. Howe, editor of the official journal of the American Chemical Society.

"The entire year of 1924 saw 48 gallons, valued at $29, imported," says Dr. Howe. "During the first quarter of 1925, 122,906 gallons, worth $56,422, were imported. In the second quarter this amount increased to 185,178 gallons at $84,622. In July 7,847 gallons, $3,865; in August 48,410 gallons, $21,493; in September 8,413 gallons, valued at $3,941; and in October 42,237 gallons, worth $17,359, were accepted. Reports from abroad indicate a large capacity for production. At the costs reported and with the market for methanol which exists here, one would expect a steady increase in the quantity shipped." "It frequently requires months of operation to establish costs," says Dr. Howe, "but if is very unlikely that the Germans have found the product more expensive than was anticipated. Furthermore, with increased production costs should go even lower.

"Perhaps our competitors," he goes on to say, "have concluded that it is wiser to make a larger profit on the finished articles for the manufacture of which methanol is a raw material, than to take a profit on methanol itself, or, maybe, the tariff situation is the deciding factor. German producers abhor the American tariff. The reduction provided by law has seen our dyestuffs imports double. If a special effort is made to revise the methanol tariff upward, it is possible that other tariffs might go with it and at least introduce a decided uncertainty into the chemical tariff situation." Dr. Howe suggests that "the I.G. may consider these uncertainties too great to wish to have them enter into the present established business and may therefore be willing to sacrifice the methanol business for the larger stake. Maybe production is being curtailed in order to adjust prices to avoid charges of dumping in America. The final possibility, namely, a working arrangement with American producers of methanol, seems least likely.

American Research

"The methanol question, therefore, continues to be of vital interest. The Bureau of Mines has announced a programme of work which may place us in the same favourable position as regards synthetic methanol. Research is also proceeding under private auspices."

Saville Shaw Medal Awards

A general meeting of the members of the Society of Chemical Industry, Newcastle-on-Tyne Section, will be held in the Chemical Lecture Theatre, Armstrong College, on Wednesday, January 13, at 7.30 p.m. The Saville Shaw Memorial Medals will be presented by the Chairman to R. Harrison, for his metallographic work on the Copper-Tin Alloys; K. N. Welch, for his work on the preparation and properties of the boric acid esters; Mr. S. H. Collins will read a note on "The Sugars of the Jerusalem Artichoke."

Indian Chemical Notes

(From our Own Correspondent.)

What is really the first chemical works in India dealing with the by-products of salt on a large scale has been started in Kathiawar in the State of Dhragandra. The works will cost about Rs. 50 lakhs. In undertaking a concern of this nature the State collected all the information necessary and consulted the best experts. The resources of raw material in the State are ample and good prospects of the industry are assured. Most of the machinery has been ordered from England and the first consignment is to arrive in Bombay in a few weeks' time. The works are known as the Shri Shakti Alkali Works.

In reporting on the state of industries in Baroda, the Government of Baroda mentions the important assistance given by the State Chemical Laboratory to the development of new industries in the State. Numbers of problems were investigated and difficulties were solved to a considerable extent.

Considerable progress was made last year in the cultivation of lac by the Forest Department of the Province of Bihar and Orissa in co-operation with the Indian Lac Research Institute. Government have further given sanction to a comprehensive scheme for the establishment of eight lac plantations of 750 acres each to be opened in the more important lac districts of the Province. The capital outlay involved in the scheme is Rs. 1 lakh.

The total quantity of fine gold and silver produced in the gold mines of Mysore during 1924, was 392,578 oz. and 21,243 oz. respectively, showing an increased output of 11,000 and 2,000 oz. roundly as compared with the previous year. The total value of bullion produced amounted to £1.8 million, showing an increase of 4½ per cent. Outside the Kolar Gold Fields, nine mining blocks of four areas of prospecting licenses relating to chrome, manganese and kaolin were inspected, and Government remark that greater attention should be given to these in future.

Food Adulteration

The Madras Government has decided to enforce the Prevention of Food Adulteration Act in selected areas of the presidency. Adulteration of foodstuffs has now grown into a scandal. A food analyst of high qualifications engaged from the United Kingdom has been at work during the last twelve months, fixing standards of purity for the various kinds of foodstuffs. He has a small laboratory attached to the King Institute at Guindy.

The Madras Government have sanctioned a loan to the Carnatic Paper Mills Co., Ltd., of Rajahmundry under the provisions of State Aid to Industries Act. The total loan granted amounts to Rs. 4½ lakhs and another loan of Rs. 3½ lakhs is under contemplation.

An industrial laboratory has been established in Delhi through the energy of the local industrial surveyor. The funds necessary for its establishment were collected voluntarily by the local merchants and industrialists.

The Maclagan Engineering College in Lahore has satisfactorily undertaken certain chemical tests on minerals, and it should be possible to extend its usefulness in this respect and in many cases save industrialists from the delay and expense incurred in sending their samples to the Alipur Test House.

Tanning and Dyeing

According to the report of the Superintendent, Punjab conditions in the leather market were quite satisfactory during 1924-25. On the whole the country tanners have had a good year, but no large profits were made by any one tannery. Two large tanneries operated at full capacity and disposed of practically all manufactured goods. Government continued to give assistance and instruction to tanners. The quality of the leather in the Punjab is still below the level of the other provinces but has improved greatly as regards colour and weight. Further improvements in liming for bag-tanned leather will produce fuller leather with less cracking. The Punjab Government Model Tannery at Shahdara was started in the latter part of February, 1925, on a minimum production basis, and the actual observation by Punjab tanners of processes is expected greatly to improve the finished leather of this province. In this model tannery, a scheme of apprentices has been put up, comprising the training of skilled tannery labour and the education and training of men for foremen and tannery superintendents. The power-house is working satisfactorily and is found adequate for present requirements.

The Government Dyeing School in the Punjab showed good progress during the last year. Besides the work of training the students for the dyeing profession, every help and assistance has been rendered to the public and the textile industries.

Imports of Dyestuffs Decrease

The official reports of the first half of the fiscal year reveal that there has been a noteworthy falling off in the imports of dyestuffs in consequence of the depressed state of the cotton mill and handloom weaving industry in India, and the total receipts fell from Rs.143 lakhs to Rs.69 lakhs. German shipments declined from Rs.110 lakhs to Rs.40 lakhs and, even so, stocks are still considerable. The United Kingdom sent only Rs.5¾ lakhs' worth, which is less than the share of the United States—Rs.9 lakhs.

Exhibition of Scientific Instruments

Physical and Optical Societies Combine

The annual exhibition of scientific apparatus by the Physical Society of London and the Optical Society was held at the Imperial College of Science, South Kensington, from Tuesday to Thursday.

The exhibition covered a very wide range and much of the apparatus was limited to electrical and optical instruments. Laboratory furnishings were prominent, and Chance Brothers and Co., Ltd., Smethwick, not only showed British optical glass in various stages of manufacture, but made a feature of resistance laboratory glassware of the quality reported on by the N.P.L. Microscopes, including radial metallurgical models for high grade work, were prominent, and L. Oertling, Ltd., had their usual display of balances, including a new type of instrument, Chemical Balance No. 43, specially designed to provide a reliable British balance at a price comparing very favourably with the foreign apparatus. A stand of particular interest was that of the Damard Lacquer Co., Ltd., Birmingham, manufacturers of "Formite" Bakelite synthetic resin products, and "Damarda" acid-resisting lacquers. The firm does not manufacture articles from their synthetic resins, but through various clients they displayed the resin made up into insulation materials, radio-insulation and various requisites such as pipes, holders, etc. The firm also showed Bakelite resins, cements, insulating varnishes, and moulding powders. The Foster Instrument Co., Letchworth, exhibited pyrometer recorders, automatic furnace controls, and a simple portable surface calorimeter for making direct readings of loss of heat from furnace walls, etc., made for the Fuel Research Station. J. J. Griffin and Sons, Ltd., and Baird and Tatlock, Ltd., showed furnaces, galvanometers, etc., and an apparatus for testing petroleum and its products, to meet the requirements of the Petroleum Technologists. There was also a pentometer of new pattern for determining the consistency of bituminous material.

In the Research and Experimental Section, in view of recent fatalities from this cause, interest was shown in the exhibit by Dr. E. Griffiths of three instruments for the measurement of the percentage of carbon dioxide in the atmosphere of fruit stores. One showed the use of a globule of mercury as a piston to force the gas to and fro through an adsorbent.

Sir William Bragg illustrated Faraday's discovery of electromagnetic induction, including original apparatus; and fundamental experiments of Newton were demonstrated.

There was an excellent attendance.

Synthetic Wool

Following the statement in Australia by Sir Frank Heath on synthetic wool (reported in The Chemical Age last week), considerable interest has been aroused in the product. It is reported that a British company, The Woolulose Holdings and Investment Co., Ltd., is concerned with the production of "silkated" wool from natural vegetable fibres as against the synthetically produced cellulose fibres of artificial silk. The cost, it is claimed, is half that of wool, but is affected by the ruling price of chemicals. The company has been offered options to acquire a factory in the Midlands and elsewhere, and it is proposed to instal a second plant and machinery near Manchester in due course. The directors are Mr. C. E. P. Groth, M.A., research chemist, of London; Mr. R. G. Harley, leather substitute manufacturer and managing director of Woolene, Ltd., Bradford; and Major J. Brigden, A.M.Inst.C.E., of London.

Laboratory Crushing and Grinding

Examples of Modern Equipment

For use in laboratories, where, of course, the material to be dealt with is small in quantity, and where the crushing or grinding machinery will usually be employed intermittently, a number of reducing machines are designed which usually take the form of a miniature edition of the units employed for commercial scale practice.

An instance of this is the tiny jaw crusher which will reduce anything from 400 to 1,500 lb. per hour. The frame of this machine is of steel, each side plate being in one piece, and secured with an arched bearing casting, a front spacer casting, and a toggle block. The vibratory jaw is mounted on an eccentric at its upper end, and rests against a toggle at its lower end. The eccentric imparts a circular or gyratory movement to the upper end, while the toggle compels the lower end to describe an arc of a small circle. The movement is both forward and downward and impels the discharge.

Adjustment for size of the product is by means of an adjusting screw which passes through the front spacer casting and fits into a recess in the adjusting block. This block engages with a service block which presses against the stationary jaw.

The smaller sizes of this crusher when hand fed will reduce 300 lb. to 400 lb. per hour from 2¼ in. down to ¼ in. When fed through a hopper the output is from 400 lb. to 500 lb. per hour. The larger machines, when hand fed, will reduce to the same size at the rate of 1,000 lb. to 1,500 lb. per hour; when hopper fed, the output can be raised as high as 2,000 lb. per hour.

All these machines operate at 400 r.p.m. The jaw dimensions vary from 6 in. by 3 in. to 9 in. by 4 in., the jaw opening from 2¼ in. by 3 in. to 2⅜ in. by 4 in., the power required is either 1 or 2 h.p., and the overall dimensions are 18 in. by 19 in. by 19 in. up to 22 in. by 25 in. by 26 in. A smaller crusher of the same type has an output of 50 lb. to 100 lb. per hour to ¼ in. and smaller. This machine requires ½ h.p., and has a jaw opening of 2 in. by 3 in.

In another laboratory crusher operating on the swinging jaw principle, about 2 cwt. of hard limestone to 5/16 in. and finer can be turned out. This crusher runs at 300 r.p.m. or thereabouts, and can be worked by hand or power, the jaw opening being 3 in. by 2 in.

The laboratory crusher working on the roll jaw principle is capable of turning out from 250 lb. to 600 lb. per hour of ⅛ in. size. The whole of the product must be crushed to this size before it can be passed through, and this fineness can be attained without the use of screens. Machines of this type are readily adjustable, and can be adapted either for coarse or fine work as desired.

The principle in this machine is that the jaws do not advance and recede at the discharge, but impart to the material a rolling crush, rolling over it and then releasing it. The jaw opening in this crusher is 2 in. by 6 in., it runs at a speed of 350 r.p.m., and requires ¼ h.p. The overall dimensions are 30 in. by 23 in. by 20 in.

The "Open Door" Crusher

A similar machine designed for assay work where it is necessary to clean the machine thoroughly after each sample has passed through is the "open door" crusher. In this design the whole of the back can be opened out like a pair of doors, giving access for cleaning. When closed the doors are locked by a handwheel. The capacity and other details of this crusher are much the same as the one described above.

A laboratory unit constructed on the rotary principle is known as the rotary fine crusher. This is built for the preliminary crushing of soft and hard materials like barytes, bauxite, coal, coke, colours, and gypsum. The machine is made in two sizes, one for power operation only, and the other for either hand or power.

The machine itself extracts a sample of the product as it crushes and delivers it through a separate spout. This sample may be as low as 5 per cent. or as high as 15 per cent. When a very small sample of a large quantity is required, the material delivered through the sampling spout is passed once again through the machine. The output of the unit is from 1 to 2 cwt. per hour of coal with hand power, and from ½ to 1 ton with power. The jaw opening is 6 in. by 18 in. in the larger machines, and 3 in. by 6 in. in the smaller. The speed of the power-operated machine is 300 r.p.m.

The principle of the balanced roll crusher has also been applied successfully to laboratory units, and, although specially designed for sampling purposes these rolls are of heavy construction and may be used for continuous operation. They will take material from the laboratory roll jaw crushers and reduce it as fine as 60 mesh. Accessibility is provided by the hingeing of the top cover, which can be thrown back to expose the whole of the machine for cleaning and inspection. The capacity is from 300 lb. to 1,000 lb. per hour at 150 r.p.m., the rolls being 8 in. by 5 in.

In another type samples are ground between manganese steel buhrstone or built-up carborundum discs, which are easily replaceable. This machine will take material up to about pea size and reduce it to almost any degree of fineness in one operation. Though principally employed for sampling purposes these grinders can be used for continuous duty, and they are frequently used in conjunction with laboratory roll jaw crushers and rolls to form a complete sampling plant.

Swing Hammer Mills

The swing hammer mill has been adapted to laboratory purposes, and may be used to crush to ⅛ in. 1,000 lb. per hour of hard limestone or 1,600 lb. of bituminous coal. It can also be used to reduce moderately hard, tough or fibrous material from 2 in. cube to about 20 mesh. Such a machine is in general use for limestone, dolomite, coal, slate, shale, soapstone, shells, bones, bark, and leather. When fitted with hatchet hammers it can be employed for shredding.

The laboratory ball mill with circumferential screen discharge can be used to grind hard materials from 2 in. cube down as far as 30–40 mesh. Such a mill is suitable for dealing with ores, slags, chemicals, and fireclays, using carbon steel balls as the grinding media. The capacity per hour to 30 mesh is from 1 to 2 cwt., ½ h.p. being required at a pulley speed of 50 r.p.m.

Batch mills for the fine grinding and mixing of different kinds of materials, chemicals, and colours will grind down to ⅛ in. to 150 mesh. The cylinder, which revolves in anti-friction metal bearings, is made of boiler plate and lined with steel plate. The grinding media are flint pebbles or steel balls.

Even the rod mill has been adapted to the laboratory, and, though it weighs only 1,100 lb., it embodies all the features of the large mill.

The chemist in search of laboratory crushing and grinding equipment has a very large field before him, but he will usually find that one machine will give him better results than any of the others, depending upon such factors as output desired, type of material to be dealt with, and the power available.

Politician and Business Man

Addressing the 205th annual banquet of the City of London Tradesmen's Club, at the Hotel Cecil on Tuesday, Sir Ernest Benn complained that during the past few years there had been a tendency on the part of the politician to usurp the place of the business man in the public mind. People as a whole had got into the habit of looking to Parliament rather than to the City of London and traders generally for the supply of the amenities and comforts of life. This was a very dangerous tendency, and it was for the City of London Tradesmen's Club and all the interests for which it stood to work to correct it. The relative values of the politician and of the business man could be stated in very simple terms. We had a system of Government in this old country of which we were proud, a system which was the model for the governments of all the world, but it was now costing us no less than £3 per week per family. That was the price that we paid for government. On the other hand, the food and the clothes of the people were left more or less to the tender mercies of the traders of the country, and it was estimated that we were fed and clothed at a cost of approximately £2 per week per family. If those figures were studied and appreciated, it was, Sir Ernest thought, fair to suggest that there was a danger of our becoming over-politicalised.

From Week to Week

TO REMOVE THE DUTY on imported calcium arsenate a Bill has been introduced into the U.S. Congress.

REGENT STREET POLYTECHNIC is now accepted by the Institute of Chemistry as a recognised institution for training for the Institute's Examinations and Associateship.

THE SALE OF PURE POTASH during 1925 amounted to about 1,220,000 tons against 840,000 tons for the previous year, according to a reported statement at the general meeting of the German Potash Syndicate.

MR. MAX MOLLER, of the University of Copenhagen, Denmark, has taken up the post of visiting professor of chemistry, under the auspices of the Rockefeller Foundation, at the Chulalongkoru University, Bangkok, Siam.

THE MELDOLA MEDAL AWARD will be decided this month, and fellows or associates of the Institute of Chemistry who desire to draw attention to cases which come within the conditions imposed should communicate immediately with the Registrar.

THE PHARMACOPŒIA COMMITTEE of the General Medical Council is to discuss the revision of the British Pharmacopœia, and other bodies, including the Pharmaceutical Society, the Royal Society, and the Chemical Society, have been invited to send delegates.

PROFESSOR J. W. McBAIN, Leverhulme Professor of Physical Chemistry at Bristol University, will lecture on Colloid Chemistry at California University in the first part of this year. In June he will be a guest of honour at the National Colloid Symposium at Cambridge, Mass.

THE SALE BY AUCTION is announced for January 13 of the land buildings, and plant at Ward Street Dyeworks (Donkin, Kenyon and Co., Ltd.), Blackburn. Stock, including chemicals, will also be sold. Catalogues are obtainable from R. Hoyle and Son, 4, St. Anne's Square, Manchester.

MR. WILFRED HILL, a member of a Birmingham chemical company, speaking at Birmingham this week, said that from personal experience he believed Germany was suffering a second defeat—an economic one which, for the next two years, would render her a harmless competitor except in such trades as aniline dyes and fine chemicals, where Germany was supreme.

THE U.S. DYE IMPORTS for November are now published, and at 414,755 lb. show a slight drop on October. The full eleven months' figures, however, are nearly double those for the similar period of 1924. These figures are 1924, 2,507,239 lb.; 1925 4,760,593 lb. Britain contributed 1 per cent. in November agains 47 per cent. each by Germany and Switzerland.

A FATAL ACCIDENT occurred at the Castner-Kellner Alkali Works Runcorn. John Hewitt was working on a girder when the tap of an experimental apparatus snapped while being turned on by a chemist. Hewitt attempted to escape the fumes, but failed, and a verdict of death from bronchitis caused by inhaling ammonia fumes was returned at the inquest on Friday, January 1.

AN IMPORTANT PURCHASE by British financiers, headed by Mr William Harrison, of London, who is the chairman of various British paper companies, covers the entire share capital of the Koholyt Co., of Berlin. This company owns sulphite pulp mills at Königsberg, East Prussia, which are said to be the biggest in the world, and also a large paper mill and chemical works on the Rhine.

IODINE FROM ARTESIAN WELL WATER is now being produced in the Dutch Indies by Vereenigde Javasche Iodiumfabrieken, at Soerabaya, Java. The product, in the form of iodine, potassium iodide, and copper iodide is exported to this country, but the quantities have declined recently. It was generally believed that the product was manufactured from seaweed at Java, but this is apparently not so.

TEN MILLION GALLONS of No. 5 completely denatured alcohol will be required in the United States market on February 1, according to reports. This demand is occasioned by the elimination of No. 6 by the Prohibition Unit. This increased demand will entail a great consumption of methanol, and it is thought that a sharp rise in prices will result and that imported methanol will be brought in to meet the shortage. The elimination of No. 6 will cancel the demand for 250,000 gallons of benzol, the chief denaturant in this grade.

CONSIDERABLE FIRE DAMAGE IS REPORTED.—On Thursday, December 31, four firemen were overcome by fumes when considerable damage was done to the Hull premises of Boots.—A flame coming into contact with a naphtha dipping tank was thought to have been responsible for the destruction of a firelighter works at Mill Hill, Blackburn, on Thursday, December 31.—The oil refining factory of M. D. Hipkins, Albion Street, Tipton, was destroyed by fire on Sunday. Two firemen were rendered unconscious by fumes.—One Exeter firemen was killed and another badly affected by fumes on Friday, January 1, when working on a coke dump fire.

MR. JOHN EVANS, F.I.C., has been nominated for the office of Sheriff for Cardiganshire.

THE INTERNATIONAL UNION of Pure and Applied Chemistry will meet at Washington, D.C., during the week commencing September 6.

THE FREEHOLD of the British Empire Exhibition, Wembley, is now being offered for sale by private treaty, or if not so sold, by auction as a whole.

ALLEGED DUMPING of strontium nitrate, phosphoric acid, and aluminum sulphate by German manufacturers is being investigated by the U.S. Customs Service.

FINAL ARRANGEMENTS for the manufacture of synthetic camphor have now been made by the Industrias Ruth, a subsidiary of the Spanish Resinera. The Ruth company has a factory at Santander, and German patents are being used.

THE THIRD DUDDELL MEDAL has been awarded by the Council of the Physical Society of London to Mr. Albert Campbell, B.A., late of the National Physical Laboratory, in recognition of his many contributions to the science of instrument design.

FOR FAILING TO ABATE A SMOKE NUISANCE several firms were fined at Manchester Police Court on Wednesday, including T. Horrocks and Sons, Ltd., tar distillers, Miles Platting, £2; and Tennants (Lancashire), Ltd., chemical manufacturers, Clayton, £5.

A CHEMICAL FACTORY is said to be contemplated for Victoria, Australia, following a recent visit of Mr. F. W. Gamble, director of Allen and Hanbury, London. If the schemes materialise the factory will supply China and the Near East as well as Australian markets.

THE DISTILLERS CO., LTD., are to take over the greater part of the interests of Macdonald, Greenlees and Williams, of Leith. It will be recalled that the Distillers Co. a few weeks ago purchased the shares of Herbert Green and Co., Ltd., industrial alcohol manufacturers, of Hull and London.

RECENT wills include—Sir Edward Cunard, Bt., of Wonsford, director of the Chloride Electrical Storage Co., £13,123 (net personalty, £12,638); Mr. G. Elliott, of Brooklands, Cheshire, dye works manager, £24,699 (net personalty, £24,483); Mr. William Robert Whitworth, Littleborough, Lancs, bleacher and dyer, £7,597.

FURTHER SUGAR BEET DEVELOPMENTS are announced. The Skoda works, Czecho-Slovakia, are to equip a second sugar refinery with a daily capacity of 1,000 tons of sugar beet.—The works of the British Sugar Manufacturers, Ltd., at Wissington, Norfolk, are running at full capacity, and will continue so until the end of the season, as the supply of beets is more than sufficient.

A "CONCRETE" SCHOLARSHIP is to be awarded by the council of the Institution of Structural Engineers, Abbey House, Westminster, through the generosity of the British Portland Cement Association. It will be a Travelling Scholarship of the value of £300 for the purpose of studying reinforced concrete construction, and will be open to all associate members under thirty-five.

A DEPOSIT OF HELIUM GAS IN ONTARIO is reported by the Ontario Government. Three wells have been taken over at Inglewood, at a cost of $40,000, and for some time helium gas has been extracted from them in co-operation with the University of Toronto. The discovery was made as a result of the war-time investigations of the Department of Mines; but in view of its importance, it was felt advisable to keep it a secret until the province was able to take the gas well over.

BRUCE STARKE AND CO., of 16, Water Lane, Great Tower Street, London, E.C.3, advise us that they have been appointed agents for the Royal Gouda Stearine Candle Co., Gouda, Holland, in succession to Mr. K. Rayment. The Royal Gouda Stearine Candle Co. has been established for 50 years and has been doing business in this country in "Gouda" Stearine for the candle, soap and perfumery trades, glycerine, all grades, oleine, stearine pitch, candles, etc. The telephone numbers of Bruce Starke and Co. are Royal 137 and 7250, and the telegraphic address is "Oleowiks, Bilgate, London."

FURTHER ARTIFICIAL SILK DEVELOPMENTS are reported.—It is now stated that the suggested Glanzstoff, Courtaulds, and Snia Viscosa merger is at present impossible, although an agreement on certain points would not be opposed.—The Dia Nippon Cotton Spinning are to erect a factory at Osaka. The new company will have a capital of 15,000,000 yen, and all machinery and plant will be German.—It is reported that Silvanoor, Ltd., has been formed with a capital of £1,000,000 and a site at Kendal.—The first exhibition of artificial silk goods is to be held at Holland Park, London, from April 19 to 24. The exhibition will be entirely British, and will be open to the public on the last day.

Obituary

MR. ARTHUR BETTH HAY, chemical manufacturer, of Burlington House, Maryhill, Glasgow, and of Ardnadam, dropped dead in the street last week, aged 68.

References to Current Literature

British

ANALYSIS.—The accuracy of graduated measuring vessels. Part I. H. V. Renn. *Ind. Chem.*, December, 1925, pp. 515–518.

COLLOIDS.—Colloidal silica. B. Wasser. *Ind. Chem.*, December, 1925, p. 548.

CORROSION.—The production of oxide films on copper at the ordinary temperature. U. R. Evans. *Chem. Soc. Trans.*, November, 1925, pp. 2484–2491.

An investigation of the effect of differential aeration on corrosion by means of electrode potential measurements. A. L. McAulay and F. P. Bowden. *Chem. Soc. Trans.*, November, 1925, pp. 2605–2610.

DISINFECTANTS.—Sheep dips. Their composition and analysis. J. S. Remington. *Ind. Chem.*, December, 1925, pp. 525–528.

FILTRATION.—Studies in filtration. J. W. Hinchley, S. G. M. Ure and B. W. Clarke. *J.S.C.I.*, January 1, 1926, pp. 1–10T.

HALOGEN COMPOUNDS.—Researches on sulphuryl chloride. Part IV. Further studies on a new chlorinating agent. Preparation of polychloro-derivatives of toluene. O. Silberrad. *Chem. Soc. Trans.*, November, 1925, pp. 2677–2684.

Symmetrical substitution derivatives of trimethylene dibromide and pentamethylene dibromide. W. H. Mills and L. Bains. *Chem. Soc. Trans.*, November, 1925, pp. 2502–2507.

PAPER.—The manufacture of paper. *Ind. Chem.*, December, 1925, pp. 529–536.

PHOTO-CHEMISTRY.—Studies with the microbalance. Part II. The photochemical decomposition of silver chloride. E. J. Hartung. *Chem. Soc. Trans.*, November, 1925, pp. 2691–2698.

SPECTROSCOPY.—The correlation of absorption spectra with ionisation in violuric acid. R. A. Morton and A. H. Tipping. *Chem. Soc. Trans.*, November, 1925, pp. 2514–2517.

Absorption spectra and lactam-lactim tautomerism. R. A. Morton and E. Rogers. *Chem. Soc. Trans.*, November, 1925, pp. 2698–2701.

SUGARS.—Synthesis of 2 : 3 : 5—(or 2 : 3 : 4)—trimethyl glucose. J. C. Irvine and J. W. H. Oldham. *Chem. Soc. Trans.*, November, 1925, pp. 2729–2735.

Glycerol glucoside. H. S. Gilchrist and C. B. Purves. *Chem. Soc. Trans.*, November, 1925, pp. 2735–2745.

WOOL.—The sulphur content of wool. S. R. Trotman and H. S. Bell. *J.S.C.I.*, January 1, 1926, pp. 10–12T.

British Dominions

ALBUMINS.—Observations on the crystallisation and specific rotation of ovalbumin and an attempt to crystallise lactalbumin. C. W. Chapman. *Canad. Chem. Met.*, December, 1925, pp. 268–270.

COLLOIDS.—Organophile colloids. G. S. Whitby. *Canad. Chem. Met.*, December, 1925, pp. 265–267.

SALT.—Salt and allied chemicals. Part I. G. E. Gollop. *Canad. Chem. Met.*, December, 1925, pp. 259–264.

United States

ANALYSIS.—The determination of hydrogen and hydroxyl ion concentrations and their significance. W. M. Clark. *J. Amer. Leather Chem. Assoc.*, December, 1925, pp. 544–564.

ATOMIC STRUCTURE.—The radii of atoms and ions. W. P. Davey. *Chem. Reviews*, October, 1925, pp. 349–367.

COMBUSTION.—Conditions governing the efficiency of gas burners. S. W. Parr. *J. Ind. Eng. Chem.*, December, 1925, pp. 1215–1216.

Length of visible flame and length of flame travel in combustion of powdered coal. H. Kreisinger. *J. Ind. Eng. Chem.*, December, 1925, pp. 1232–1233.

Factors influencing length of a gas flame burning in secondary air. E. W. Rembert and R. T. Haslam. *J. Ind. Eng. Chem.*, December, 1925, pp. 1236–1238.

DIAZOTISATION.—Nitrogen tetroxide as a reagent for diazotisation. B. Houston and T. B. Johnson. *J. Amer. Chem. Soc.*, December, 1925, pp. 3011–3018.

HYDRAZINES.—An investigation of some properties of pheny hydrazine and factors affecting hydrazone formation. E. G. R. Ardagh and J. G. Williams. *J. Amer. Chem. Soc.*, December, 1925, pp. 2976–2983.

OXIDES.—The preparation and crystal structure of ferrous oxide. R. W. G. Wyckoff and E. D. Crittenden. *J. Amer. Chem. Soc.*, December, 1925, pp. 2876–2882.

PAINTS.—Applying modern production methods to paint manufacture. F. A. Westbrook. *Chem. Met. Eng.*, December, 1925, pp. 911–914.

PAPER.—Economical use of sulphite liquor. A. W. Allen. *Chem. Met. Eng.*, December, 1925, pp. 928–931.

PECTIN.—Requirements of pectin for the commercial jelly-maker. E. Jameson. *J. Ind. Eng. Chem.*, December, 1925, pp. 1291–1292.

REDUCTION.—The preparation of some primary amines by the catalytic reduction of nitriles. W. H. Carothers and G. A. Jones. *J. Amer. Chem. Soc.*, December, 1925, pp. 3051–3057.

The reduction of cinnamic aldehyde to cinnamyl alcohol in the presence of platinum-oxide platinum black and promoters. Part XI. W. F. Tuley and R. Adams. *J. Amer. Chem. Soc.*, December, 1925, pp. 3061–3068.

TANNING.—Colloid chemistry in tanning. W. D. Bancroft. *J. Amer. Leather Chem. Assoc.*, December, 1925, pp. 565–573.

VALENCY.—Elements with anomalous valences. M. Gomberg. *Chem. Reviews*, October, 1925, pp. 301–314.

French

ACIDS.—Evolution of the manufacture of sulphuric acid by the lead chamber process in recent years. Part XIII. De Jussieu. *L'Ind. Chim.*, December, 1925, pp. 530–536.

COMBUSTION.—The theory of anti-detonants. H. Muraour. *Chim. et Ind.*, December, 1925, p. 851.

CORROSION.—Zinc and the problem of corrosion. Part III. A. Billaz. *L'Ind. Chim.*, December, 1925, pp. 541–543.

HALOGENATION.—Action of phosgene on beryllia. Preparation of beryllium chloride. C. Matignon and J. Cathala. *Compt. rend.*, December 21, 1925, pp. 1066–1068.

The reaction of bromine with zinc in the presence of various organic solvents. A. Raynaud. *Compt. rend.*, December 21, 1925, pp. 1069–1071.

The constitution of chloro derivatives of the phthalonic series. A. Cornillot. *Compt. rend.*, December 21, 1925, pp. 1071–1073.

RUBBER.—Rubber and the rubber industry. J. C. Bongrand. *Chim. et Ind.*, December, 1925, pp. 823–838.

SAFFRON.—Saffron. G. Pierlot. *Chim. et Ind.*, December, 1925, pp. 839–850.

Miscellaneous

ANALYSIS.—Micro-methods for the estimation of sodium. E. Tschopp. *Helv. Chim. Acta*, December, 1925, pp. 893–900.

CRYSTALLISATION.—The effect of the addition of dyestuffs on the crystallisation of calcium carbonate. V. Kohlschütter and C. Egg. *Helv. Chim. Acta*, December, 1925, pp. 697–703.

DYEING.—The dyeing of cellulose acetate silk. Part I. V. Kartaschoff. *Helv. Chim. Acta*, December, 1925, pp. 928–942.

HALOGENATION.—The chlorination of *o*-and *p*-amino-benzoic acids. L. Elion. *Rec. Trav. Chim. Pays-Bas*, December, 1925, pp. 1106–1108.

The introduction of two atoms of bromine into acetyl-*m*-toluidine. S. C. J. Olivier. *Rec. Trav. Chim. Pays-Bas*, December, 1925, pp. 1109–1112.

REDUCTION.—The reduction of aromatic nitro-cyano compounds. H. Rupe and H. Vogler. *Helv. Chim. Acta*, December, 1925, pp. 832–838.

The mechanism of reduction. Part VI. H. J. Prins. *Rec. Trav. Chim. Pays-Bas*, December, 1925, pp. 1093–1100.

The catalytic reduction of some cyano compounds of naphthalene. H. Rupe and A. Metzger. *Helv. Chim. Acta*, December, 1925, pp. 838–848.

Patent Literature

The following information is prepared from published Patent Specifications and from the Illustrated Official Journal (Patents) by permission of the Controller to H.M. Stationery Office. Printed copies of full Patent Specifications accepted may be obtained from the Patent Office, 25, Southampton Buildings, London, W.C.2, at 1s. each

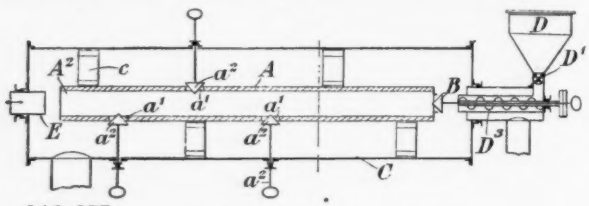
Abstracts of Complete Specifications

243,505. Dyestuff Intermediates, Production of. J. Thomas and Scottish Dyes, Ltd., Murrell Hill Works, Carlisle. Application date, July 2, 1924.

The object is to obtain β-substituted nitro-anthraquinones from para-substituted benzoyl-benzoic acids. These acids are condensed in strong sulphuric acid or weak oleum, and the *b*-substituted anthraquinones thus formed nitrated in the same sulphuric acid solution to mono-nitro-β-substituted anthraquinone derivatives. The crude product thus obtained is treated with an alkaline reducing agent and washed, to remove impurities and obtain an amido derivative. In an example, mono-chlorbenzol and phthalic-anhydride are condensed in the presence of aluminium chloride, and the para-chlorbenzoyl-benzoic acid obtained is dissolved in 6 per cent. oleum. The mixture is heated to 140° C. for 2 hours, when the ring formation is complete, and then cooled below 18° C. and sodium nitrate gradually added. The mixture is allowed to stand for 16 hours at ordinary temperature, mixed with water, boiled, again diluted, and filtered, yielding nitro-2-chloranthraquinone. This product can be purified and reduced by boiling with sodium sulphide, filtering, and washing. This removes most of the oxybodies, leaving amido-2-chloranthraquinone, which melts at 176°-180° C. Any unnitrated β-substituted anthraquinone can be removed by dissolving in strong sulphuric acid and gradually diluting it. Para-toluoyl-benzoic acid may be similarly treated by this process.

243,857. Distillation of Carbonaceous Materials. B. Laing, Abdale House, Hatfield, Herts, and H. Nielsen, 13, Firs Avenue, Muswell Hill, London. Application date, October 10, 1924.

In the distillation of carbonaceous materials such as coal, shale, lignite, peat, wood, sewage sludge, etc., at low temperature by means of an inert gas, the important factors are the temperature range, the period of distillation, and the



243,857

nature of the atmosphere within the retort. In this invention, these factors can be independently controlled by providing means for admitting the inert gas at different points in the interior of the retort.

The retort C is provided with an inner concentric tube A, which may have a valve B at its outlet end. The inlet end A^2 is arranged a short distance away from the opening of the conduit E through which the hot gases for distillation are introduced. The tube A is attached to the retort C by plates *c*, and is provided at various points along its length with openings a^1, controlled by valves a^2, the spindles of which extend outwards through the wall of the retort so that the valves may be manually operated.

The material to be distilled is fed from a hopper *D* through a rotary valve D^1 to a screw conveyor D^3, which delivers it into the retort. Part of the gas from the tube *E* enters the tube *A*, owing to the resistance of the material in the retort, and this hot gas may be distributed to the retort by the valves a^2 as required. In an alternative construction, the tube *A* may be replaced by passages formed in the firebrick lining surrounding the retort. The hot gas is admitted to the retort as required, through passages arranged at various points along its length and provided with valves. The material to be distilled may thus be caused to pass through zones the temperature of which may be adjusted to any desired point.

243,925. N-Methyl-Sulphites of Secondary Aromatic Aliphatic Amines, Manufacture of. Farbwerke vorm. Meister, Lucius, and Bruning, Hoechst-on-Main, Germany, M. Bockmuhl, 90, Konigsteinerstrasse, Unterdiederback, Hoechst-on-Main, Germany, and A. Schwarz, 41, Oppenheimerlandstrasse, Frankfurt-on-Main, Germany. Application date, January 24, 1925. Addition to 164,002.

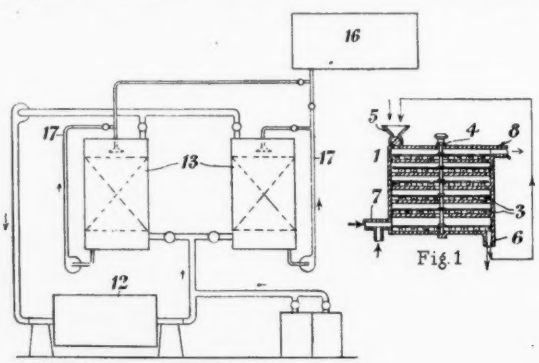
Specification No. 164,002 describes the production of N-methyl sulphites of secondary aromatic-aliphatic amines by condensing secondary aromatic-aliphatic amines other than methyl aniline, ethyl aniline, or benzyl aniline, with formaldehyde bisulphite. In this invention these therapeutic substances are obtained by treating a secondary aromatic-aliphatic amine other than methyl aniline, ethyl aniline, benzyl aniline, an N-alkylated anthranilic acid or nucleal substitution product thereof, with formaldehyde and a bisulphite separately, or by alkylating a condensation product obtained from a primary aromatic amine and formaldehyde, and then treating the product with a bisulphite with or without formaldehyde. Examples are given of the production of sodium-1-phenyl-2 : 3-dimethyl-5-pyrazolone-4-ethylamino-methyl-sulphite, sodium - N - methyl - paraphenetidine - methyl - sulphite, and sodium-1-phenyl-2 : 3-dimethyl-4-methylamino-5-pyrazolone-methyl-sulphite by several different methods.

243,942.—Retorts for the Destructive Distillation or Heat Treatment of Solid Materials.—A. L. J. Queneau, c/o The Mining and Metallurgical Club, 3, London Wall Buildings, London Wall, London, E.C.2. Application date, February 23, 1925.

In externally heated retorts the capacity is not increased by increasing the diameter, since the heating surface increases as the first power of the diameter while the volume increases as the second power. In this invention the capacity is increased while maintaining an efficient diameter of about 24 inches, by employing three or more such retorts side by side and in open communication throughout their length. Each unit is provided with a separate conveyor comprising a co-axial shaft carrying a series of blades or knives. The paths of the knives or blades of adjacent units intersect one another, but the knives themselves are arranged so that they do not touch. The shaft of each conveyor is deformable by the provision of a number of universal joints along its length.

243,978. Anhydrous Magnesium Chloride, Method of Producing. C. Arnold, London. From The Dow Chemical Co., Midland, Mich., U.S.A. Application date, April 27, 1925.

In the production of anhydrous magnesium chloride difficulties are experienced owing to the fact that the normal hexahydrate melts and forms a solution in its water of



243,978 Fig 2. Fig.1

crystallisation at a relatively low temperature. The solution thus obtained must be dehydrated at a very slight increase in temperature to avoid decomposition of the salt. The object of this invention is to avoid this difficulty. The salt is partly

dehydrated in a shelf drier 1, through which it is passed from the upper to the lower shelves by means of rotating devices 3 on a vertical shaft 4. The material is fed into the drier through a hopper 5, and discharged at an outlet 6, while combustion gases are admitted at an inlet 7 and discharged at an outlet 8. The temperature of the gases is regulated by admitting air at 9 so that the temperature varies from 115° C. at the top to 350° C. at the bottom. The partly dehydrated product as discharged consists mainly of dihydrate, $MgCl_2 2H_2O$, and part of this is transferred to the hopper 5 and added to the normal hexahydrate in a proportion of about 1 : 2. This mixture is not liable to decomposition as is the normal hydrate. The dihydrate which is not returned to the hopper 5 is transferred to an externally heated rotary drier 12, and treated with a current of hydrochloric acid gas. The gas is then passed through one of a pair of towers 13, through which sulphuric acid is circulated until it reaches a density of 60° Bé by absorption of water from the hydrochloric acid gas. The towers 13 are used alternately, and the diluted acid is reconcentrated in an apparatus 16 into which it passes through pipes 17. The temperature in the drum 12 is gradually raised from 200° C. to 500° C. if the chloride is dehydrated in batches, or the temperature varies within these limits from one end of the drum to the other if the drying operation is continuous. In this process most of the water of crystallisation is expelled by ordinary air drying, so that the anhydrous chloride is produced at a lower cost.

NOTE.—Abstracts of the following specifications which are now accepted appeared in THE CHEMICAL AGE when they became open to inspection under the International Convention : 224,521 (H. Muller-Clemm and I. Schmidt), relating to a process for making granular highly active charcoal, see Vol. XII, p. 59 ; 232,612 (F. Lehnhoff-Wyld), relating to manufacture of organic arsenic compounds, see Vol. XII, p. 642.

LATEST NOTIFICATIONS.

244,708. Manufacture of dry halogen-calcium-starch preparations. Henkel and Cie, Ges. December 16, 1924.
244,727. Process for concentrating latex. K.D.P., Ltd. December 20, 1924.
244,730. Process of obtaining hydrogenation gas for hydrogenating carbon and hydrocarbons from gases containing methane and hydrogen. Bergius, Dr. F. December 18, 1924.
244,746. Manufacture of aromatic stibinic acids. Chemische Fabrik von Heyden Akt.-Ges. December 18, 1924.
244,747. Manufacture of derivatives of pyridine-3-carboxylic acid. Soc. of Chemical Industry in Basle. December 20, 1924.
244,764. Process of manufacturing sulphuric acid. Petersen, H. December 16, 1924.
244,775. Recovery of phenols from ammoniacal liquor. Le Heffner, R. W., and Tiddy, W. December 16, 1924.
244,782. Manufacture of azo-dyestuffs. Akt.-Ges. für Anilin Fabrikation. December 16, 1924.
245,101. Process for the manufacture of refractory substances from high grade oxide of zirconium. Deutsche Gasgluhlicht-Auer-Ges. December 24, 1924.
245,107. Manufacture of CC-substituted compounds of barbituric acid. Chemische Fabrik Auf Actien (vorm. E. Schering). December 24, 1924.
245,128. Manufacture of new azo dyestuffs. I. G. Farbenindustrie Akt.-Ges. December 19, 1924.
245,129. Process for the manufacture of solutions. I. G. Farbenindustrie Akt.-Ges. December 22, 1924.
245,152. Process for the production of concentrated solutions of alkali cyanides. Deutsche Gold- und Silber Scheideanstalt vorm. Roessler. December 23, 1924.
245,157. Dyeing-apparatus. Kirchhof, F. December 26, 1924.
245,165. Manufacture of condensation products of the anthraquinone series. I. G. Farbenindustrie Akt.-Ges. December 27, 1924.

Specifications Accepted with Date of Application

222,125. Condensation products of the anthraquinone series, Manufacture of. Farbwerke vorm. Meister, Lucius and Brüning. September 18, 1923. Addition to 205,502.
228,153. Catalytic manufacture of hydrogen by the action of water vapour upon carbon monoxide, Apparatus for effecting the recovery of heat and water vapour. G. L. E. Patart. January 21, 1924.
233,649. Polymerised styrol and its homologues, Manufacture of. Naugatuck Chemical Co. May 7, 1924.
238,900. Hydrated products of olefines, Production of. Rochlingsche Eisen und Stahlwerke Akt.-Ges. August 23, 1924.
241,223. Recovering antimony from alloys. Huttenwerke Templohof A. Meyer. October 11, 1924.
243,768. Polymerised styrol, Manufacture of. Naugatuck Chemical Co. May 7, 1924.
244,035. CC-substituted compounds of barbituric acid and 4-dimethylamino 2 : 3-dimethyl-1-phenyl-5-pyrazolone, Process for the manufacture of. P. Pfeiffer. December 3, 1924. Addition to 231,512.
244,506. Neutral base exchange zeolite-like materials. Treatment of. E. B. Higgins. September 10, 1924.
244,526. Alkali oxysalt of tin, Treatment of solutions containing. H. Harris. September 18, 1924.
244,645. Stable bicarbonate of ammonium, Manufacture and production of. J. Y. Johnson. (*Badische Anilin und Soda Fabrik.*) May 21, 1925.

Applications for Patents

Andrich, K., and Deutsche Gold- und Silber Scheideanstalt vorm. Roessler. Production of concentrated solutions of alkali cyanides. 32,508. December 23.
Bähr, H. Process for converting sulphuretted hydrogen into sulphurous acid. 32,438. December 23.
British Synthetics, Ltd., and Higgins, E. B. Manufacture of dye intermediates. 32,700. December 28.
Bube, K. Carbonisation and cracking of bituminous materials under pressure. 32,377. December 22.
Bube, K. Process for decreosotising tars, etc. 32,378. December 22.
Bube, K. Desulphurisation of naphthalene, etc. 32,379. December 22.
Bube, K. Separation of pulverulent carbon at low temperatures. 32,380. December 22.
Bube, K. Production of viscous oils from cracked distillates. 32,381. December 22.
Carpmael, W., and I. G. Farbenindustrie Akt.-Ges. Manufacture of azo dyestuffs. 63. January 1.
(Chemische Fabrik Grünau Landshoff and Meyer Akt.-Ges.) and Potts, H. E. Production of amino-oxy compounds of the aromatic series. 32,768. December 29.
Chemische Fabrik vorm. Sandoz. Production of azo-dyestuffs. 32,911. December 30. (Germany, January 6.)
Chemische Fabrik vorm. Sandoz. Process for increasing affinity of animal fibres for dyestuffs. 32,912. December 30. (Germany, January 6.)
Deutsche Gold und Silber Scheideanstalt vorm. Roessler. Production of concentrated solutions of alkali cyanides. 32,509. December 23. (Germany, December 23, 1924.)
Drescher, H. A. E., Scottish Dyes, Ltd., and Thomas, J. Dyestuffs and intermediates. 32,603. December 24.
Ellis, G. B., and Soc. of Chemical Industry in Basle. Vat dyes. 32,910. December 30.
Ellis, G. B., and Soc. of Chemical Industry in Basle. Vat dyes. 32,991. December 31.
Farbwerke vorm. Meister, Lucius and Brüning. Manufacture of finely-subdivided pigment dyes. 32,265. December 21. (Germany, June 8.)
Heyl, G. E. Transport and distillation of mineral oils, etc. 32,815, 32,816. December 29.
Holliday and Co., L. B., and Young, A. Dyeing, stencilling, etc., cellulose acetate, etc. 32,281. December 22.
I. G. Farbenindustrie Akt.-Ges. Manufacture of azo-dyestuffs. December 21. 32,234. (Germany, December 19, 1924.)
I. G. Farbenindustrie Akt.-Ges. Manufacture of solutions. December 21. 32,235. (Germany, December 22, 1924.)
I. G. Farbenindustrie Akt.-Ges. Manufacture of condensation products of the anthraquinone series. 32,759. December 28. (Germany, December 27, 1924.)
I. G. Farbenindustrie Akt.-Ges. Manufacture of azo dyestuffs. 117. January 2. (Germany, January 8, 1925.)
I. G. Farbenindustrie Akt.-Ges. Process for treating cellulose derivatives. 127. January 2. (Germany, January 2, 1925.)
Kirchhof. F. Dyeing apparatus. 32,574. December 24. (Czecho-Slovakia, December 26, 1924.)
Mason, W. O. S. Dyeing. 32,241. December 21.
Schmidt, E., and Zellstofffabrik Waldhof. Production of chlorine and sulphate from alkali chlorides. 32,371. December 22. (Germany, March 21.)
Scottish Dyes, Ltd. Manufacture and use of dyestuffs. 32,249 December 21.
Scottish Dyes, Ltd., Smith, W., and Thomas, J. Production of dyestuffs. 32,487. December 23.
Siegel, W. Manufacture of sodium fluoride from silico-hydrofluoric acid. 44. January 1.
Siemens Akt.-Ges., F. Process for converting sulphuretted hydrogen into sulphurous acid. 32,438. December 23.
Soc. d'Etudes Minières et Industrielles. Manufacture of metallic nitrides and ammonia. 33,003. December 31. (France, January 8.)
Taylor, L. N. Recovery of sodium compounds. 32,731. December 28.
Waterproofers (Moreton's Process), Ltd. Waterproofing textiles, etc. December 24.

Weekly Prices of British Chemical Products

The prices and comments given below respecting British chemical products are based on direct information supplied by the British manufacturers concerned. Unless otherwise qualified, the figures quoted apply to fair quantities, net and naked at makers' works.

General Heavy Chemicals

ACID ACETIC, 40% TECH.—£19 per ton.

ACID BORIC, COMMERCIAL.—Crystal, £40 per ton, Powder, £42 per ton.

ACID HYDROCHLORIC.—3s. 9d. to 6s. per carboy d/d, according to purity, strength, and locality.

ACID NITRIC, 80° TW.—£21 10s. to £27 per ton, makers' works, according to district and quality.

ACID SULPHURIC.—Average National prices f.o.r. makers' works, with slight variations up and down owing to local considerations; 140° Tw., Crude Acid, 60s. per ton. 168° Tw., Arsenical, £5 10s. per ton. 168° Tw., Non-arsenical, £6 15s. per ton.

AMMONIA ALKALI.—£6 15s. per ton f.o.r. Special terms for contracts.

BLEACHING POWDER.—Spot, £9 10s. d/d; Contract, £8 10s. d/d, 4-ton lots.

BISULPHITE OF LIME.—£7 10s. per ton, packages extra, returnable.

BORAX, COMMERCIAL.—Crystal, £25 per ton. Powder, £26 per ton. (Packed in 2-cwt. bags, carriage paid any station in Great Britain.)

CALCIUM CHLORATE (SOLID).—£5 12s. 6d. to £5 17s. 6d. per ton d/d, carr. paid.

COPPER SULPHATE.—£25 to £25 10s. per ton.

METHYLATED SPIRIT 64 O.P.—Industrial, 2s. 5d. to 2s. 11d. per gall. Mineralised, 3s. 8d. to 4s. per gall., in each case according to quantity.

NICKEL SULPHATE.—£38 per ton d/d.

NICKEL AMMONIA SULPHATE.—£38 per ton d/d.

POTASH CAUSTIC.—£30 to £33 per ton.

POTASSIUM BICHROMATE.—4½d. per lb.

POTASSIUM CHLORATE.—3¾d. per lb., ex wharf, London, in cwt. kegs.

SALAMMONIAC.—£45 to £50 per ton d/d. Chloride of ammonia, £37 to £45 per ton, carr. paid.

SALT CAKE.—£3 15s. to £4 per ton d/d. In bulk.

SODA CAUSTIC, SOLID.—Spot lots delivered, £15 2s. 6d. to £18 per ton, according to strength; 20s. less for contracts.

SODA CRYSTALS.—£5 to £5 5s. per ton ex railway depots or ports.

SODIUM ACETATE 97/98%.—£21 per ton.

SODIUM BICARBONATE.—£10 10s. per ton, carr. paid.

SODIUM BICHROMATE.—3½d. per lb.

SODIUM BISULPHITE POWDER 60/62%.—£17 per ton for home market, 1-cwt. iron drums included.

SODIUM CHLORATE.—3d. per lb.

SODIUM NITRITE, 100% BASIS.—£27 per ton d/d.

SODIUM PHOSPHATE.—£14 per ton, f.o.r. London, casks free.

SODIUM SULPHATE (GLAUBER SALTS).—£3 12s. 6d. per ton.

SODIUM SULPHIDE CONC. SOLID, 60/65.—£13 5s. per ton d/d. Contract, £13. Carr. paid.

SODIUM SULPHIDE CRYSTALS.—Spot, £8 12s. 6d. per ton d/d. Contract, £8 10s. Carr. paid.

SODIUM SULPHITE, PEA CRYSTALS.—£14 per ton f.o.r. London, 1-cwt. kegs included.

Coal Tar Products

ACID CARBOLIC CRYSTALS.—4¾d. per lb. Crude 60's, 1s. to 1s. 4d. Little demand.

ACID CRESYLIC 97/99.—1s. 7d. to 1s. 9d. per gall. Pale, 95%, 1s. 5d. to 1s. 9d. per gall. Dark, 1s. 4d. to 1s. 8d. per gall. Good demand.

ANTHRACENE PASTE 40%.—3d. per unit per cwt.—Nominal price. No business.

ANTHRACENE OIL, STRAINED.—8d. per gall. Good inquiry. Unstrained, 7d. per gall.

BENZOL.—Crude 65's, 11d. to 1s. 3d. per gall., ex works in tank wagons. Standard Motor, 1s. 8d. to 1s. 10d. per gall., ex works in tank wagons. Pure, 1s. 11d. to 2s. 3d. per gall., ex works in tank wagons.

TOLUOL.—90%, 1s. 8d. to 1s. 9d. per gall. Pure, 1s. 11d. to 2s. 3d. per gall.

XYLOL COMMERCIAL.—2s. 3d. per gall. Pure, 3s. 3d. per gall.

CREOSOTE.—Cresylic, 20/24%, 8½d. per gall. Market very quiet. Standard specification, 6¾d. to 7¼d. per gall.; middle oil, heavy, 6¼d. per gall. Market steady.

NAPHTHA.—Crude 1s. per gall. Solvent 90/160, 1s. 5d. to 1s. 11d. per gall. Fair business. Solvent 90/190, 1s. 1d. to 1s. 6d. per gall. Moderate demand.

NAPHTHALENE CRUDE.—Drained Creosote Salts, £4 to £5 per ton. Whizzed or hot pressed, £5 10s. to £6.

NAPHTHALENE.—Crystals and Flaked, £12 to £13 per ton, according to districts.

PITCH.—Medium soft, 55s. to 60s. per ton, according to district. Market active.

PYRIDINE.—90/160, 19s. 6d. to 20s. per gall. Firmer. Heavy, 10s. 6d. to 11s. per gall. More inquiry.

Intermediates and Dyes

In the following list of Intermediates delivered prices include packages except where otherwise stated.

ACETIC ANHYDRIDE 95%.—1s. 7d. per lb.

ACID AMIDONAPHTHOL DISULPHO (1-8-2-4).—10s. 9d. per lb.

ACID ANTHRANILIC.—7s. per lb. 100%.

ACID BENZOIC.—1s. 9d. per lb.

ACID GAMMA.—9s. per lb.

ACID H.—3s. 6d. per lb. 100% basis d/d.

ACID NAPHTHIONIC.—2s. 2d. per lb. 100% basis d/d.

ACID NEVILLE AND WINTHER.—4s. 9d. to 4s. 10d. per lb. 100% basis d/d.

ACID SULPHANILIC.—9d. per lb. 100% basis d/d.

ALUMINIUM CHLORIDE, ANHYDROUS.—10d. per lb. d/d.

ANILINE OIL.—7d. to 7½d. per lb. naked at works.

ANILINE SALTS.—7d. to 8d. per lb. naked at works.

ANTIMONY PENTACHLORIDE.—1s. per lb. d/d.

BENZALDEHYDE.—2s. 1½d. per lb. Good home inquiry.

BENZIDINE BASE.—3s. 6d. per lb. 100% basis d/d.

BENZYL CHLORIDE 95%.—1s. 1d. per lb.

p-CHLORPHENOL.—4s. 3d. per lb. d/d.

p-CHLORANILINE.—3s. per lb. 100% basis.

o-CRESOL 29/31° C.—3d. per lb. Demand quiet.

m-CRESOL 98/100%.—2s. 1d. to 2s. 3d. per lb. Demand moderate.

p-CRESOL 32/34° C.—2s. 1d. to 2s. 3d. per lb. Demand moderate.

DICHLORANILINE.—2s. 3d. per lb.

DICHLORANILINE S. ACID.—2s. 3d. per lb. 100% basis.

DIETHYLANILINE.—4s. 3d. per lb. d/d., packages extra, returnable.

DIMETHYLANILINE.—2s. per lb. d/d. Drums extra.

DINITROBENZENE.—9d. per lb. naked at works.

DINITROCHLORBENZENE.—£84 per ton d/d.

DINITROPHENOL.—1s. 1d. per lb., 100% basis.

DINITROTOLUENE.—48/50° C. 8d. to 9d. per lb. naked at works. 66/68° C. 10d. per lb. naked at works.

DIPHENYLANILINE.—2s. 10d. per lb. d/d.

G. SALT.—2s. 2d. per lb. 100% basis d/d.

a-NAPHTHOL.—2s. per lb. d/d. Fair home inquiry.

B-NAPHTHOL.—11d. to 1s. per lb. d/d. Fair home inquiry.

a-NAPHTHYLAMINE.—1s. 3d. per lb. d/d. Fair home inquiry.

B-NAPHTHYLAMINE.—3s. 9d. per lb. d/d. Fair home inquiry.

o-NITRANILINE.—5s. 9d. per lb.

m-NITRANILINE.—3s. 6d. per lb. d/d.

p-NITRANILINE.—1s. 10d. per lb. d/d. Fair home inquiry.

NITROBENZENE.—5¼d. per lb. naked at works. Good home inquiry.

o-NITROCHLORBENZOL.—2s. 3d. per lb. 100% basis d/d.

NITRONAPHTHALENE.—10d. per lb. d/d.

p-NITROPHENOL.—1s. 9d. per lb. 100% basis d/d.

p-NITRO-*o*-AMIDO-PHENOL.—4s. 6d. per lb. 100% basis.

m-PHENYLENE DIAMINE.—4s. per lb. d/d.

p-PHENYLENE DIAMINE.—9s. 9d. per lb. 100% basis d/d.

R. SALT.—2s. 4d. per lb. 100% basis d/d.

SODIUM NAPHTHIONATE.—1s. 9d. per lb. 100% basis d/d.

o-TOLUIDINE.—9d. per lb. naked at works.

p-TOLUIDINE.—2s. 2d. per lb. naked at works.

m-TOLUYLENE DIAMINE.—4s. per lb. d/d.

m-XYLIDINE ACETATE.—2s. 11d. per lb. 100%.

Wood Distillation Products

ACETATE OF LIME.—Brown, £7 10s. Quiet market. Grey, £15 10s. per ton. Better inquiry. Liquor, 9d. per gall. 32° Tw.

ACETONE.—£81 per ton.

CHARCOAL.—£7 5s. to £9 per ton, according to grade and locality. Demand fair.

IRON LIQUOR.—1s. 6d. per gall. 32° Tw. 1s. 2d. per gall., 24° Tw.

RED LIQUOR.—10d. per gall. 16° Tw.

WOOD CREOSOTE.—2s. 9d. per gall. Unrefined.

WOOD NAPHTHA, MISCIBLE.—3s. 10d. per gall. 60% O.P. Solvent, 4s. 6d. per gall. 40% O.P. Very quiet.

WOOD TAR.—£3 to £4 10s. per ton, according to grade.

BROWN SUGAR OF LEAD.—£42 per ton.

Rubber Chemicals

ANTIMONY SULPHIDE.—Golden, 6d. to 1s. 5d. per lb., according to quality, Crimson, 1s. 3d. to 1s. 7½d. per lb., according to quality.

ARSENIC SULPHIDE, YELLOW.—2s. per lb.

BARYTES.—£3 10s. to £6 15s. per ton, according to quality.

CADMIUM SULPHIDE.—2s. 9d. per lb.

CARBON BISULPHIDE.—£20 to £25 per ton, according to quantity.

CARBON BLACK.—5½d. per lb., ex wharf.

CARBON TETRACHLORIDE.—£50 to £55 per ton, according to quantity, drums extra.

CHROMIUM OXIDE, GREEN.—1s. 2d. per lb.

DIPHENYLGUANIDINE.—3s. 9d. per lb.

INDIARUBBER SUBSTITUTES, WHITE AND DARK.—5¾d. to 6¾d. per lb.

LAMP BLACK.—£35 per ton, barrels free.
LEAD HYPOSULPHITE.—9d. per lb.
LITHOPONE, 30%.—£22 10s. per ton.
MINERAL RUBBER "RUBPRON."—£13 12s. 6d. per ton f.o.r. London.
SULPHUR.—£9 to £11 per ton, according to quality.
SULPHUR CHLORIDE.—4d. per lb., carboys extra.
SULPHUR PRECIP. B.P.—£47 10s. to £50 per ton.
THIOCARBAMIDE.—2s. 6d. to 2s. 9d. per lb. carriage paid.
THIOCARBANILIDE.—2s. 1d. to 2s. 3d. per lb.
VERMILION, PALE OR DEEP.—5s. 3d. per lb.
ZINC SULPHIDE.—1s. 1d. per lb.

Pharmaceutical and Photographic Chemicals

ACID, ACETIC, 80% B.P.—£39 per ton ex wharf London in glass containers.
ACID, ACETYL SALICYLIC.—2s. 6d. to 2s. 7d. per lb. Keen competition continuing. Good demand.
ACID, BENZOIC B.P.—2s. to 2s. 3d. per lb., according to quantity.
ACID, BORIC B.P.—Crystal, £46 per ton; Powder, £50 per ton. Carriage paid any station in Great Britain, in ton lots.
ACID, CAMPHORIC.—19s. to 21s. per lb.
ACID, CITRIC.—1s. 4d. per lb., less 5%. Unsettled.
ACID, GALLIC.—2s. 8d. per lb. for pure crystal, in cwt. lots.
ACID, PYROGALLIC, CRYSTALS.—5s. 3d. per lb. Resublimed, 7s. 6d.
ACID, SALICYLIC.—1s. 3½d. to 1s. 5½d. per lb. Technical.—10½d. to 11d. per lb.
ACID, TANNIC B.P.—2s. 10d. per lb.
ACID, TARTARIC.—1s. 0½d. per lb., less 5%. Market firm.
AMIDOL.—6s. 6d. per lb., d/d.
ACETANILIDE.—1s. 7d. to 1s. 8d. per lb. for quantities.
AMIDOPYRIN.—12s. 6d. per lb.
AMMONIUM BENZOATE.—3s. 3d. to 3s. 6d. per lb., according to quantity.
AMMONIUM CARBONATE B.P.—£37 per ton. Powder, £39 per ton in 5 cwt. casks.
ATROPINE SULPHATE.—11s. per oz. for English make.
BARBITONE.—10s. per lb.
BENZONAPHTHOL.—3s. 3d. per lb. spot.
BISMUTH CARBONATE.—15s. 6d. to 17s. 6d. per lb.
BISMUTH CITRATE.—12s. 9d. to 14s. 9d. per lb.
BISMUTH SALICYLATE.—12s. 6d. to 14s. 6d. per lb.
BISMUTH SUBNITRATE.—13s. to 15s. per lb. according to quantity.
BORAX B.P.—Crystal, £29; Powder, £30 per ton. Carriage paid any station in Great Britain, in ton lots.
BROMIDES.—Potassium, 1s. 9d. to 1s. 11d. per lb.; sodium, 2s. to 2s. 2d. per lb.; ammonium, 2s. 3d. to 2s. 5d. per lb., all spot.
CALCIUM LACTATE.—1s. 3½d. to 1s. 5½d. Market firmer.
CHLORAL HYDRATE.—3s. 5d. to 3s. 6d. per lb., duty paid.
CHLOROFORM.—2s. 3d. to 2s. 7½d. per lb., according to quantity.
CREOSOTE CARBONATE.—6s. per lb.
FORMALDEHYDE.—£41 per ton, in barrels ex wharf.
GLYCEROPHOSPHATES.—Fair business passing. Calcium, soluble and citrate free, 7s. per lb.; iron, 8s. 9d. per lb.; magnesium, 9s. per lb.; potassium, 50%, 3s. 6d. per lb.; sodium, 60%, 2s. 6d. per lb.
GUAIACOL CARBONATE.—7s. per lb.
HEXAMINE.—2s. 4d. to 2s. 6d. per lb.
HOMATROPINE HYDROBROMIDE.—30s. per oz.
HYDRASTINE HYDROCHLORIDE.—English make offered at 120s. per oz.
HYDROGEN PEROXIDE (12 VOLS.).—1s. 8d. per gallon f.o.r. makers' works, naked.
HYDROQUINONE.—4s. 4¾d. per lb., in cwt. lots.
HYPOPHOSPHITES.—Calcium, 3s. 6d. per lb., for 28-lb. lots; potassium, 4s. 1d. per lb.; sodium, 4s. per lb.
IRON AMMONIUM CITRATE B.P.—2s. to 2s. 3d. per lb. Green, 2s. 4d. to 2s. 9d. per lb. U.S.P., 2s. 1d. to 2s. 4d. per lb.
MAGNESIUM CARBONATE.—Light Commercial, £33 per ton net.
MAGNESIUM OXIDE.—Light Commercial, £70 per ton, less 2½ %, price reduced; Heavy Commercial, reduced to £23 per ton, less 2½%; Heavy Pure, 2s. to 2s. 3d. per lb., according to quantity.
MENTHOL.—A.B.R. recrystallised B.P., 31s. 6d. net per lb., December delivery. Synthetic, 22s. 6d. to 27s. 6d. per lb., according to quality. English make. Very heavy demand.
MERCURIALS.—Red oxide, 5s. 2d. to 5s. 4d. per lb.; Corrosive sublimate, 3s. 9d. to 3s. 11d. per lb.; white precipitate, 4s. 6d. to 4s. 8d. per lb.; Calomel, 4s. to 4s. 2d. per lb. Market flat.
METHYL SALICYLATE.—1s. 7d. per lb.
METHYL SULPHONAL.—16s. 9d. per lb.
METOL.—9s. per lb. British make.
PARAFORMALDEHYDE.—1s. 11d. for 100% powder.
PARALDEHYDE.—1s. 4d. per lb.
PHENACETIN.—4s. to 4s. 3d. per lb.
PHENAZONE.—6s. to 6s. 3d. per lb. Spot lower than forward price.
PHENOLPHTHALEIN.—4s. to 4s. 3d. per lb. Supply exceeds demand.
POTASSIUM BITARTRATE 99/100% (Cream of Tartar).—80s. per cwt., less 2½% for ton lots. Market very firm.
POTASSIUM CITRATE.—1s. 11d. to 2s. 2d. per lb.
POTASSIUM FERRICYANIDE.—1s. 9d. per lb. in cwt. lots. Quiet.
POTASSIUM IODIDE.—16s. 8d. to 17s. 2d. per lb., according to quantity. Steady market.
POTASSIUM METABISULPHITE.—7½d. per lb., 1-cwt. kegs included, f.o.r. London.
POTASSIUM PERMANGANATE.—B.P. crystals, 7½d. per lb., spot. slightly easier.
QUININE SULPHATE.—2s. 3d. to 2s. 4d. per oz., in 100 oz. tins. Steady market.
RESORCIN.—3s. 9d. per lb. In fair quantities.
SACCHARIN.—51s. 5d. to 53s. 8d. per lb., according to quantity. Limited inquiry.
SALOL.—3s. per lb.
SILVER PROTEINATE.—12s. per lb. for satisfactory product light in colour.
SODIUM BENZOATE, B.P.—1s. 10d. to 2s. 2d. per lb.
SODIUM CITRATE, B.P.C., 1911.—1s. 8d. to 1s. 11d. per lb., B.P.C., 1923. 1s. 11d. to 2s. 2d. per lb., according to quantity.
SODIUM FERROCYANIDE.—4d. per lb. carriage paid.
SODIUM HYPOSULPHITE, PHOTOGRAPHIC.—£14 to £15 per ton, according to quantity, d/d consignee's station in 1-cwt. kegs.
SODIUM METABISULPHITE CRYSTALS.—37s. 6d. to 60s. per cwt., net cash, according to quantity.
SODIUM NITROPRUSSIDE.—16s. per lb.
SODIUM POTASSIUM TARTRATE (ROCHELLE SALT).—75s. to 80s. per cwt., according to quantity.
SODIUM SALICYLATE.—Powder, 2s. per lb. Crystal, 2s. 1d. per lb. Very heavy demand.
SODIUM SULPHIDE, PURE RECRYSTALLISED.—10d. to 1s. 2d. per lb.
SODIUM SULPHITE, ANHYDROUS, £27 10s. to £28 10s. per ton, according to quantity; 1-cwt. kegs included.
SULPHONAL.—12s. per lb. Limited demand.
TARTAR EMETIC, B.P.—Crystal or Powder, 1s 8d. to 1s. 9d. per lb.
THYMOL.—12s. to 15s. per lb. Strong demand.

Perfumery Chemicals

ACETOPHENONE.—9s. per lb.
AUBEPINE (EX ANETHOL).—10s. 3d. per lb.
AMYL ACETATE.—3s. per lb.
AMYL BUTYRATE.—6s. 6d. per lb.
AMYL SALICYLATE.—3s. 3d. per lb.
ANETHOL (M.P. 21/22° C.).—6s. per lb.
BENZYL ACETATE FROM CHLORINE-FREE BENZYL ALCOHOL.—2s. 4d. per lb.
BENZYL ALCOHOL FREE FROM CHLORINE.—2s. 4d. per lb.
BENZALDEHYDE FREE FROM CHLORINE.—2s. 9d. per lb.
BENZYL BENZOATE.—2s. 9d. per lb.
CINNAMIC ALDEHYDE NATURAL.—16s. 9d. per lb.
COUMARIN.—11s. 9d. per lb.
CITRONELLOL.—16s. per lb.
CITRAL.—9s. per lb.
ETHYL CINNAMATE.—9s. per lb.
ETHYL PHTHALATE.—3s. per lb.
EUGENOL.—10s. per lb.
GERANIOL (PALMAROSA).—22s. 6d. per lb.
GERANIOL.—7s. to 16s. per lb.
HELIOTROPINE.—6s. per lb.
ISO EUGENOL.—14s. 6d. per lb.
LINALOL EX BOIS DE ROSE.—18s. per lb.
LINALYL ACETATE.—18s. per lb.
METHYL ANTHRANILATE.—9s. 3d. per lb.
METHYL BENZOATE.—6s. per lb.
MUSK KETONE.—35s. per lb.
MUSK XYLOL.—5s. 9d. per lb.
NEROLIN.—4s. per lb.
PHENYL ETHYL ACETATE.—14s. per lb.
PHENYL ETHYL ALCOHOL.—10s. 6d. per lb.
RHODINOL.—36s. 6d. per lb.
SAFROL.—1s. 4d. per lb.
TERPINEOL.—1s. 6d. per lb.
VANILLIN.—21s. 6d. to 23s. 6d. per lb. Good demand.

Essential Oils

ALMOND OIL.—12s. 6d. per lb.
ANISE OIL.—3s. 7d. per lb.
BERGAMOT OIL.—28s. per lb.
BOURBON GERANIUM OIL.—13s. per lb.
CAMPHOR OIL.—60s. per cwt.
CANANGA OIL, JAVA.—11s. 3d. per lb.
CINNAMON OIL, LEAF.—5d. per oz.
CASSIA OIL, 80/85%.—10s. 9d. per lb.
CITRONELLA OIL.—Java, 85/90%, 3s. 6d. Ceylon, 2s. 6d. per lb.
CLOVE OIL.—7s. 3d. per lb.
EUCALYPTUS OIL, 70/75%.—1s. 10d. per lb.
LAVENDER OIL.—French 38/40%, Esters, 25s. 6d. per lb.
LEMON OIL.—7s. 6d. per lb.
LEMONGRASS OIL.—4s. 9d. per lb.
ORANGE OIL, SWEET.—11s. 3d. per lb.
OTTO OF ROSE OIL.—Bulgarian, 60s. per oz. Anatolian, 35s. per oz.
PALMA ROSA OIL.—13s. 6d. per lb.
PEPPERMINT OIL.—Wayne County, 125s. per lb. Japanese, 20s. per lb.
PETITGRAIN OIL.—9s. 6d. per lb.
SANDAL WOOD OIL.—Mysore, 26s. per lb. Australian, 13s. 5d.

London Chemical Market

The following notes on the London Chemical Market are specially supplied to* THE CHEMICAL AGE *by Messrs. R. W. Greeff & Co., Ltd., and Messrs. Chas. Page & Co., Ltd., and may be accepted as representing these firms' independent and impartial opinions.

London, January 8, 1926.

BUSINESS has been quite brisk this week, and there is a satisfactory volume of business to report. At the time of writing there is practically no change in values, and of course the markets will take a day or two to settle down. Export trade has opened somewhat quietly, but there is a fair volume of inquiry about.

General Chemicals

ACETONE continues firm and active at £80 to £83 per ton on the spot, stocks are light.

ACID ACETIC continues in fair demand at £37 per ton for 80% technical and £39 per ton for pure, ex store.

ACID FORMIC continued firm with good business passing, price is unchanged at £50 to £51 per ton.

ACID LACTIC has been more active and the price is firm at £43 per ton for 50% by weight.

ACID OXALIC continues firm at 3⅜d. to 3⅞d. per lb., the resale parcels recently in evidence have now practically been absorbed.

ACID TARTARIC is quiet and the market is easy at 11¼d. to 11½d. per lb.

ALUMINA SULPHATE continues active, and is in brisk demand at £5 10s. to £5 15s. per ton for 17/18%.

AMMONIUM CHLORIDE continues weak at about £18 10s. per ton and there is very little interest shown for forward account.

ARSENIC.—There are a few inquiries in the market, and the position is steadier than has been the case for some time past, the price, however, is nominally unchanged at £15 to £16 per ton.

BARIUM CHLORIDE continues very firm and with added demand at £9 15s. to £10 per ton.

BLEACHING POWDER is unchanged at £9 per ton, moderate business passing.

CREAM OF TARTAR is scarce, and the market is very firm at £76 per ton.

EPSOM SALTS are firm and in good request at £5 15s. per ton.

FORMALDEHYDE.—Stocks are low, but on the other hand demand is also poor, price unchanged at £43 to £44 per ton.

LEAD ACETATE is more active at £44 to £45 for white and £43 per ton for brown.

LIME ACETATE is firm at £18 per ton with a fair demand.

LITHOPONE unchanged at £19 to £20 per ton.

METHYL ALCOHOL is fairly active at about £48 per ton.

METHYL ACETONE is firm and unchanged at £52 to £55 per ton.

POTASSIUM CARBONATE AND CAUSTIC are unchanged.

POTASSIUM CHLORATE is not so active and the price is unchanged at £19 10s. per ton.

POTASSIUM PERMANGANATE.—A fair business is reported at the price of 7¼d. per lb.

POTASSIUM PRUSSIATE is extremely active and inclined to be scarce, price is well held at 7¼d. per lb.

SODIUM ACETATE is becoming scarce, but supplies can still be obtained at £19 10s. per ton.

SODIUM BICHROMATE is unchanged.

SODIUM NITRITE is only in fair demand at £22 10s. per ton.

SODIUM PRUSSIATE is firm and in good request at 4½d. per lb.

SODIUM SULPHIDE is weak.

ZINC SULPHATE is in fair request at £13 to £14 per ton with a moderate demand.

Coal Tar Products

The market generally maintains a firm tone, and supplies are comparatively scarce for forward business.

90% BENZOL is steady at 1s. 10d. per gallon on rails.

PURE BENZOL is worth 2s. 1d. to 2s. 2d. per gallon on rails.

CREOSOTE OIL is easier at 6½d. per gallon on rails in the north, while the price in London remains at 7½d. per gallon.

CRESYLIC ACID is very firm, and supplies are very scarce at 1s. 10d. to 1s. 11d. per gallon on rails for the pale quality, 97/99%, while the dark quality, 95/97%, is worth 1s. 6d. to 1s. 7d. per gallon on rails.

SOLVENT NAPHTHA shows an advance in price, and supplies over the next three months are scarce. The price is from 1s. 5½d. to 1s. 6½d. per gallon on rails.

HEAVY NAPHTHA shows a revival, and is quoted at about 1s. 2d. per gallon on rails.

NAPHTHALENES are unchanged generally. The lower grades are worth from £4 to £4 10s. per ton, the 76/78 quality about £6 per ton, and the 74/76 quality about £5 10s. per ton.

PITCH prices are well maintained. The demand is satisfactory, and the approximate value to-day is about 57s. 6d. f.o.b. U.K. ports.

Latest Oil Prices

LONDON.—LINSEED OIL closed steadier at 25s. to 12s. 6d. decline. Spot, £32; January and January-April, £30 12s. 6d.; May-August, £31; September-December, £30 17s. 6d. RAPE OIL.—Quiet. Crude crushed spot, £48 10s.; technical refined, £51 10s. COTTON OIL.—Dull. Refined common edible, £42; Egyptian crude, £35; deodorised, £44. TURPENTINE quiet at a net rise of 6d. per cwt. for spot at 69s. 3d.; February-April, 69s. 6d., paid; 69s. 9d., sellers.

Nitrogen Products Market

Export.—The market has not yet fully awakened after the sluggish tone which commenced just before the holidays. Consumers are later than usual in covering their requirements, and it is expected that there will be a rush of buying towards the end of the month.

British producers are quoting for prompt shipment, £12 7s. 6d. per ton (in single bags), f.o.b. U.K. port with higher prices for shipment up to April. Only small sales are being made at present, but sellers are holding firm at this figure.

Home.—Home buyers are showing signs of interest, and there is a steady move-out of sulphate from works to consumers. It is expected that as the month advances, orders will become larger until the seasonal rush of February/April. Prices have been announced, and it seems most unlikely that any alteration will take place.

Nitrate of Soda.—The nitrate market continues quiet. Cargoes c.i.f. chief European ports are changing hands around £11 5s. per ton. Higher prices are being quoted for later arrivals.

Recent Chemical Tenders Accepted

RECENT chemical tenders accepted include—A grampic mixer for Provan Chemical Works for the Corporation, Arnott and Co., Cambridge, £335. For following supplies for Glasgow Corporation, chemicals, drugs, etc., Cockburn and Co., Ltd.; oils, etc., T. and H. Smith, Ltd., both of Glasgow. For supply and delivery of salt to Lewisham B.C., T. Elliott, Ltd., 35s. per ton. Tar and bitumen, for Ashington U.D.C., Consett Iron Co; Portland cement (4,000 tons), for Egyptian State Railways, J. Homsy; laboratory equipment for Southport T.C., North of England School Furnishing Co., £2,142. Welding plant and accessories, for Southend T.C., Allen Liversidge, Ltd., £509.

International Combustion, Ltd., of Africa House, Kingsway, inform us that their associated company of France has recently received the following contracts for the installation of Lopulco pulverised fuel equipment:—Sociate Intercommule Belge d'Electricité, complete equipment for two Ladd-Beleville boilers; Holland State Mines, Heerlam, Holland, four Lopulco combustion chambers equipped with water screens and Murray fin tubes, 24 Lopulco burners, and 24 Lopulco feeders; Haut Katanga, complete Lopulco equipment for four boilers.

A complete refuse destructor installation for the city of Caracas, Venezuela, is to be supplied by Meldrums, Ltd., Timperley, at a cost of nearly £30,000. It will consist of two independent plants each consisting of a 4-grade "Meldrum" simplex destructor, with watertube boiler, regenerator, chimney and containing building. The two plants will destroy the entire refuse of the city amounting to 100 tons a day with entire freedom from any nuisance, and will provide steam for electrical generation. The resultant clinker will be used for making mortar and concrete slabs, etc.

U.S. Salt Combine

THE California Salt Co., The Leslie Salt Refining Co., and The Continental Salt and Chemical Co. of San Francisco and The California Rock Salt Co. and Golden West Products Co. of Los Angeles, have consolidated under the name of Leslie California Salt Co., with headquarters at San Francisco. The consolidated company will have assets of approximately $3,500,000 and will continue the activities of the constituent concerns including the production of salt for household, chemical, agricultural and other purposes. The California Salt Co. alone has an annual capacity of 55,000 tons. The California Rock Salt Co. also produces calcium chloride and gypsum. Most of the works involved are on San Francisco Bay.

Scottish Chemical Market

The following notes on the Scottish Chemical Market are specially supplied to* THE CHEMICAL AGE *by Messrs. Charles Tennant and Co., Ltd., Glasgow, and may be accepted as representing the firm's independent and impartial opinions.

Glasgow, January 8, 1926.

THE Heavy Chemical Market still remains rather flat. There have been, however, one or two inquiries for forward delivery, both for home consumption and export. Prices on the whole remain unchanged.

Industrial Chemicals

ACID ACETIC, 98/100%.—Quoted £55 to £67 per ton, according to quantity and packing, c.i.f. U.K. port. 80% pure, £40 to £41 per ton; 80% technical, £38 to £39 per ton, packed in casks c.i.f. U.K. ports.

ACID BORIC.—Crystal, granulated, or small flaked, £40 per ton; powdered, £42 per ton, packed in bags carriage paid U.K. stations.

ACID CARBOLIC, ICE CRYSTALS.—Quoted 4⅜d. per lb., delivered or f.o.b. U.K. port, but in little demand and could probably be obtained for a fraction less.

ACID CITRIC, B.P. CRYSTALS.—Unchanged at about 1s. 3⅜d. per lb., less 5%, ex wharf, in moderate demand.

ACID FORMIC 85%.—Offered from the continent at about £49 10s. per ton, ex wharf, early delivery.

ACID HYDROCHLORIC.—In little demand. Price 6s. 6d. per carboy, ex works.

ACID NITRIC 80°.—Remains unchanged at £23 5s. per ton, ex station, full truck loads.

ACID OXALIC 98/100%.—Spot material quoted 3¾d. per lb., ex wharf. Could be obtained slightly cheaper for prompt shipment from the continent.

ACID SULPHURIC.—144°, £3 12s. 6d. per ton; 168°, £7 per ton, ex works, full truck loads. Dearsenicated quality, 20s. per ton more.

ACID TARTARIC, B.P. CRYSTALS.—In poor demand. Price nominally 11¾d. per lb., less 5% ex wharf.

ALUMINA SULPHATE, 17/18% IRON FREE.—On offer from the continent at about £5 10s. per ton c.i.f. U.K. ports. Spot material available at £6 5s. per ton, ex store.

ALUM, LUMP POTASH.—Quoted £8 per ton c.i.f. U.K. ports. Prompt shipment from the continent. Spot material available at about £9 5s. per ton, ex store. Powdered quality on offer from the continent at about £7 10s. per ton, c.i.f. U.K. ports.

AMMONIA ANHYDROUS.—In moderate demand and price unchanged at 1s. 4½d. per lb., less 5% ex station. Containers extra and returnable.

AMMONIA CARBONATE.—Lump, £37 per ton; powdered, £39 per ton packed in 5 cwt. casks delivered U.K. ports.

AMMONIA LIQUID 880°.—In usual steady demand and price unchanged at 2½d. to 3d. per lb. delivered, according to quantity.

AMMONIA MURIATE.—Grey galvaniser's crystals of British manufacture quoted £26 to £27 per ton, ex station. On offer from the continent at about £22 10s. per ton, c.i.f. U.K. ports. Fine white crystals quoted £18 15s. per ton. c.i.f. U.K. ports, prompt shipment from the continent.

ARSENIC, REFINED WHITE CORNISH.—Price remains unchanged at about £17 15s. per ton, ex wharf. Prompt despatch from works. Spot material quoted £19 per ton, ex store.

BARIUM CHLORIDE.—Large white crystals quoted £9 per ton, ex store, spot delivery. On offer from the continent at about £7 15s. per ton c.i.f. U.K. ports. Fine white crystals, £7 5s. per ton, c.i.f. U.K. ports.

BLEACHING POWDER.—English material quoted at £9 10s. per ton, ex station. Contracts 20s. per ton less. On offer from the continent at about £7 15s. per ton, c.i.f. U.K. ports.

BARYTES.—English material unchanged at £5 5s. per ton, ex works. Continental quoted £5 per ton, c.i.f. U.K. ports.

BORAX.—Granulated, £24 10s. per ton; crystals, £25 per ton; powdered, £26 per ton. Carriage paid U.K. stations.

CALCIUM CHLORIDE.—English manufacturers' price unchanged at £5 12s. 6d. to £5 17s. 6d. per ton, carriage paid U.K. stations. Continental quoted £3 10s. per ton, c.i.f. U.K. ports.

COPPERAS, GREEN.—Some inquiry for export. Price about £3 12s. 6d. per ton f.o.b. U.K. ports.

COPPER SULPHATE.—In good demand for export and price for English material unchanged at £24 per ton, f.o.b. U.K. ports. Continental quoted £22 per ton, ex wharf.

FORMALDEHYDE 40%.—Spot material on offer at £40 per ton, ex store. Quoted £38 per ton, c.i.f. U.K. ports, prompt shipment.

GLAUBER SALTS.—English material unchanged at £4 per ton, ex store or station. Continental on offer at about £3 per ton c.i.f. U.K. ports.

LEAD, RED.—Imported material now on offer at about £42 10s. per ton, ex store.

LEAD, WHITE.—Quoted £42 per ton, ex store, spot delivery. Slightly cheaper to come forward.

LEAD ACETATE.—White refined crystals offered from the continent at about £41 10s. per ton c.i.f. U.K. ports. Spot material quoted £44 10s. per ton, ex store.

MAGNESITE, GROUND CALCINED.—In moderate demand and price unchanged at about £8 15s. per ton, ex station.

POTASH CAUSTIC, 88/92%.—Syndicate prices vary from £25 10s. to £28 15s. per ton, c.i.f. U.K. ports, according to quantity and destination. Spot material available at about £29 per ton, ex store.

POTASSIUM BICHROMATE.—Unchanged at 4½d. per lb. delivered.

POTASSIUM CARBONATE, 96/98% quality quoted £25 10s. per ton, ex wharf, early delivery. Spot material available at about £26 10s. per ton, ex store. 90/92% quality quoted £22 10s. per ton, c.i.f. U.K. ports.

POTASSIUM CHLORATE.—In good demand for export. Prices for powdered about £28 10s. f.o.b. continental ports. Crystals about £2 per ton more. Limited quantities available for shipment to the U.K. of powdered quality at about £29 10s. per ton, c.i.f. U.K. ports.

POTASSIUM NITRATE, SALTPETRE.—Quoted £24 5s. per ton, c.i.f. U.K. ports. Prompt shipment. Spot material available at about £26 15s. per ton, ex store.

POTASSIUM PERMANGANATE, B.P. CRYSTALS.—Spot material quoted 8d. per lb. ex store. Offered for early delivery at 7½d. per lb. ex wharf.

POTASSIUM PRUSSIATE, YELLOW.—In good demand and price unchanged at about 7¾d. per lb., ex store. Offered for prompt shipment from the continent at about 7½d. per lb., ex wharf.

SODA CAUSTIC.—76/77%, £17 10s. per ton; 70/72%, £16 2s. 6d. per ton; broken 60%, £16 12s. 6d. per ton; powdered 98/99%, £20 17s. 6d. per ton. All carriage paid U.K. stations, spot delivery. Contracts, 20s. per ton less.

SODIUM ACETATE.—On offer at about £18 5s. per ton, ex store, spot delivery. Quoted £17 15s. per ton, c.i.f. U.K. port, prompt shipment.

SODIUM BICARBONATE.—Refined recrystallised quality £10 10s. per ton, ex quay or station. M.W. quality, 30s. per ton less.

SODIUM BICHROMATE.—English price unchanged at 3½d. per lb. delivered.

SODIUM CARBONATE, SODA CRYSTALS.—£5 to £5 5s. per ton, ex quay or station; powdered or pea quality, £1 7s. 6d. more; alkali, 58%, £8 12s. 3d. per ton, ex quay or station.

SODIUM HYPOSULPHITE.—Large crystals of English manufacture quoted £9 per ton, ex station. Minimum 4-ton lots; pea crystals, £14 per ton, ex station. Continental commercial quality offered at £9 per ton, ex store.

SODIUM NITRATE.—Quoted £13 per ton, ex store; 95/98% refined quality, 7s. 6d. per ton extra.

SODIUM NITRITE, 100%.—Quoted £24 per ton, ex store. Offered from the continent about £22 5s. per ton, c.i.f. U.K. ports.

SODIUM PRUSSIATE, YELLOW.—Still in good demand. Quoted 4¾d. per lb., ex store. On offer from the continent at a fraction less.

SODIUM SULPHATE, SALTCAKE.—Price for home consumption, £3 10s. per ton, ex works. Good inquiry for export and higher prices obtainable.

SODIUM SULPHIDE 60/65%.—Solid, £13 5s. per ton; broken, £14 5s. per ton; flake, £15 5s. per ton; crystals, 31/34%, £8 12s. 6d. per ton. All delivered buyers' works U.K. minimum 5-ton lots with slight reduction for contracts. 60/62% Solid quality offered from the continent at about £10 10s. per ton, c.i.f. U.K. ports; broken, £1 per ton more; crystals, 30/32%, £7 10s. per ton, c.i.f. U.K. ports.

SULPHUR.—Flowers, £10 10s.; roll, £9 10s.; rock, £9 7s. 6d.; ground, £9 5s. per ton, ex store, spot delivery. Prices nominal.

ZINC CHLORIDE.—British material, 95/98%. Quoted about £24 per ton, f.o.b. U.K. ports; 98/100% solid on offer from the continent at about £22 10s. per ton, c.i.f. U.K. ports; powdered, about 20s. per ton extra.

ZINC SULPHATE.—Of continental manufacture on offer at about £11 per ton, ex wharf.

NOTE.—The above prices are for bulk business, and are not to be taken as applicable to small parcels.

Coal Tar Intermediates and Wood Distillation Products

N.W. ACID.—4s. 10d. per lb. per 100%. Some home inquiries.
PARANITRANILINE.—1s. 10d. per lb. Small home inquiries.
DIMETHYLANILINE.—1s. 11d. to 2s. Some home inquiries.
H. ACID.—3s. 6d. per lb. Fair home inquiries.

Manchester Chemical Market

(From Our Own Correspondent.)

Manchester, January 8, 1926.

With the exception of bleaching powder and caustic soda, makers' prices for which have been cut, values of most lines of heavy chemicals are quite steady and in some cases firm. Business during the week has been on a moderate scale, although, in view of the season, the volume may be regarded as satisfactory. More encouraging reports as to the state of actual business in the cotton textile industry have been circulated this week and the chemical trade may be expected to benefit if these are substantiated.

Heavy Chemicals

Saltcake remains an easy section of the market at £3 per ton, consumers showing no very marked disposition to buy. Glauber salts, also, are quiet though prices are unchanged at round £3 5s. per ton. Chlorate of soda is firm at about 3d. per lb., and inquiry is fairly brisk. Sodium sulphide is weak and the demand is limited; 60-65 per cent. concentrated is on offer at £11 10s. to £11 15s. per ton, and crystals at £9 10s. Soda crystals keep steady at £5 5s. per ton and the volume of business is pretty well maintained. Caustic soda is moving in fair quantities at the reduced prices, which range from £15 2s. 6d. per ton for 60 per cent. strength to £17 10s. for 76-77 per cent. Alkali is unchanged at £6 15s. per ton and inquiry is on quietly steady lines. Acetate of soda values have moved up, current quotations being from £18 to £18 10s. per ton. Bicarbonate of soda is maintained at round £10 10s. per ton, but demand has not been too active. Bleaching powder is now offering at £8 10s. per ton, with demand quiet at the moment. Hyposulphite of soda is attracting only a moderate amount of attention at £14 to £14 10s. for photographic quality and £9 15s. per ton for commercial material. Prussiate of soda is well held at 4d. to 4¼d. per lb. Bichromate of soda is in quiet request at about 3¼d. per lb. Phosphate of soda is in rather small demand, though at £12 5s. to £12 10s. per ton quotations are not much changed.

A fair inquiry for both caustic potash and carbonate of potash is being met with and values are firm. Caustic, 90 per cent. strength, is quoted at about £29 per ton, and carbonate, 96-98 per cent., at £26 10s. Bichromate of potash has been rather slow at 4½d. per lb. Permanganate of potash is in limited demand, but prices are about held at round 5¾d. per lb. for commercial quality and 7¼d. for pharmaceutical. Chlorate of potash is unaltered at round 4d. per lb., with inquiry moderately active. Yellow prussiate of potash is also firm at 7¼d. per lb.

Business in sulphate of copper is restricted and quotations are easy at from £24 to £24 5s. per ton. Interest in arsenic also continues quiet and values remain weak, white powdered, Cornish makes, offering at round £14 per ton at mines. Nitrate of lead is not in much demand, but prices keep steady at £40 to £41 per ton. No change can be reported in acetate of lead, white fetching from £44 to £45 per ton and brown round £40. Grey acetate of lime is well maintained at £16 to £16 10s. per ton, and demand is fairly good; brown is quoted at £7 10s. Epsom salts are on the quiet side at £3 10s. per ton, with magnesium sulphate, pharmaceutical quality, unchanged at round £4 10s.

Acids and Coal Tar Products

Among the acid products, acetic is quiet but steady at round £37 per ton for 80 per cent. commercial material, and £67 to £68 for glacial. Oxalic acid meets with some inquiry and prices are unaltered at about 3¾d. per lb. Tartaric and citric acids are both in quiet demand at 11½d. and 1s. 3d. to 1s. 3½d. per lb. respectively.

Coal-tar products generally have been rather quiet this week. Pitch is quoted at about 52s. 6d. per ton. Carbolic acid is an extremely dull section of the market at 4¼d. to 4½d. per lb. for crystals and nominally 1s. 4d. per gallon for crude. The demand for naphthalene is only moderate, crude qualities offering at from £4 10s. per ton upward, and refined at round £13 10s. Solvent naphtha is quiet but steady at about 1s. 5½d. per gallon. Creosote oil is maintained at 6¼d. to 6½d. per gallon.

Chemical Trade Inquiries

The following inquiries, abstracted from the "Board of Trade Journal," have been received at the Department of Overseas Trade (Development and Intelligence), 35, Old Queen Street, London, S.W.1. British firms may obtain the names and addresses of the inquirers by applying to the Department (quoting the reference number and country), except where otherwise stated.

Paints and Varnishes.—A British firm in Seville wishes to represent a British firm manufacturing paints and varnishes. (Reference No. 789.)

Lubricating Oils and Greases.—A commission agent of Bogota wishes to represent a British firm manufacturing lubricating oil and greases. (Reference No. 794.)

Drugs.—The Egyptian Department of Public Health are calling for tenders for the supply of drugs, etc., required during the year 1926-7. Further particulars from the D.O.T. (Reference BX. 2,263.)

Commercial Copperas.—Salford B.C. want 600 tons delivered at the rate of 25 tons per week to June 30. Samples for analysis and tenders endorsed "Copperas" must be delivered to Chairman, River Committee, Town Hall, by January 13.

Chemicals.—A firm in Vienna wishes to represent British manufacturers and exporters of industrial and technical chemicals; metals, particularly copper, tin and quicksilver, and ores, especially iron pyrites. (Reference No. 13.)

Painters' Appliances.—A firm of wholesale merchants in Sweden desires to represent British exporters of the above lines. (Repetition of Reference No. 635.) (Reference No. 28.)

New Chemical Trade Marks

Applications for Registration

This list has been specially compiled for us by Mr. H. T. P. Gee, Patent and Trade Mark Agent, Staple House, 51 and 52, Chancery Lane, London, W.C.2, from whom further information may be obtained, and to whom we have arranged to refer any inquiries relating to Patents, Trade Marks and Designs.

Opposition to the Registration of the following Trade Marks can be lodged up to January 30, 1926.

"Cibacete."

463,145. Chemical substances used in manufactures, photography or philosophical research, and anti-corrosives. Class 1. Society of Chemical Industry in Basle (a joint stock company organised under the laws of the Swiss Republic), 141 to 227, Klybeckstrasse, Basle, Switzerland; manufacturers and merchants. (To be Associated, Sect. 24.) October 12, 1925.

"Wallfortis."

464,010. Chemical substances used in manufactures, photography or philosophical research and anti-corrosives. Class 1. The Harvie Corporation, Ltd., Broadway Buildings, Broadway, Westminster, London, S.W.1; manufacturers and merchants. (To be Associated, Sect. 24.) November 6, 1925.

"Roadfortis."

464,011. Chemical substances used in manufactures, photography or philosophical research and anti-corrosives. Class 1. The Harvie Corporation, Ltd., Broadway Buildings, Broadway, Westminster, London, S.W.1; manufacturers and merchants. (To be Associated, Sect. 24.) November 6, 1925.

"Cemenfortis."

464,012. Chemical substances used in manufactures, photography, or philosophical research, and anti-corrosives. Class 1. The Harvie Corporation, Ltd., Broadway Buildings, Broadway, Westminster, S.W.1; manufacturers and merchants. (To be Associated, Sect. 24.) November 6, 1925.

"Tetmal."

464,106. Chemical substances prepared for use in medicine and pharmacy, made in Great Britain. Tetmal, Ltd., 41, Finsbury Square, London, E.C.2, and 45, Farringdon Street, London, E.C.4; manufacturing and distributing chemists. November 7, 1925.

"Cibacete."

463,146. Raw, or partly prepared, vegetable, animal and mineral substances used in manufactures, not included in other classes. Class 4. Society of Chemical Industry in Basle (a joint stock company organised under the laws of the Swiss Republic), 141 to 227, Klybeckstrasse, Basle, Switzerland; manufacturers and merchants. (To be Associated Sect. 24.) October 12, 1925.

Company News

KAYE'S RUBBER LATEX PROCESS CO.—An interim dividend of 10 per cent. is announced on the ordinary shares and 1s. per share on the deferred shares.

NEW TRANSVAAL CHEMICAL CO.—Final dividends for the year ended June 30 last of 3 per cent., less tax, on the cumulative first preference, and 4 per cent., less tax, on the cumulative "A" preference shares have been declared.

ELECTROLYTIC ZINC CO. OF AUSTRALASIA.— A dividend at the rate of 12 per cent. per annum for the six months ended December 31 last has been declared on the preference and the ordinary shares, payable at the registered office of the company on March 3.

EXPLOSIVES AND CHEMICAL PRODUCTS, LTD.—An extraordinary general meeting will be held at Finsbury Pavement House, London, on January 14, at 12 noon, when the resolutions concerning the capital of the company, which were passed at the extraordinary general meeting held on December 30, will be submitted for confirmation as special resolutions.

Tariff Changes

TRINIDAD.—An export tax is now imposed on—sugar (every 1,000 lb.), 9d.; molasses (every 100 galls.), 7d.; and copra (every 100 lb.), 2s. 6d.

FRENCH W. AFRICA.—An export duty of 1 per cent. *ad valorem* is imposed on whale manure, and of 2 per cent. *ad valorem* on whale fats, oils, etc.

ITALY.—By reason of the most-favoured-nation provisions the following tariff alterations consequent upon the German-Italian agreement are applicable to U.K. goods. The following are the revised chemical and dye sections :—

Articles.	Customs Duty.	Co-efficient of Increase. Former.	Fixed by the Treaty.
	Lire (gold).		
Anethol, cumarin, heliotropine, eucalyptol, eugenol, ionine, iraldine, terpineol, thymol	15% *ad val.* per 100 kilogs.	—	10% *ad val.** per 100 kilogs.
Sulphoricinate of ammonium, potassium, and sodium	12	0·2	10*
INORGANIC CHEMICAL PRODUCTS.			
Phosphoric acid	10	—	5*
Caustic potash	3	0·5	—
Carbonate of ammonium	12	0·2	—
Carbonate of potassium	2	0·5	—
Nitrate of barium and of strontium	20	—	15*
Nitrate of potassium	3	—	2*
Nitrites of potassium and sodium	10	0·2	—
Sulphate of potassium	5	1	0·5
Receptacles of sheet-iron containing caustic soda, sulphates of potassium and sodium are subject to the same Tariff treatment as the product which they contain.			
Dry phosphate of sodium	10	0·2	—
Thiosulphate of sodium	5	0·5	—
Peroxides of potassium	25	0·6	—
Peroxide of sodium	25	0·3	—
Ferricyanides	15	0·5	—
Chlorosulphonic acid and artificial cryolite.....	10	0·5	—
Chloride of zinc and pyrophosphate of sodium	10	0·5	0·2
ORGANIC CHEMICAL PRODUCTS.			
Benzoic acid	100	—	75*
Formic acid	20	0·1	—
Oxalic acid	20	0·2	10*
Methyl alcohol	30	—	10*
Chrome acetate	10	0·2	7·50*
Chloride of ethylene	30	—	25*
Lactates not specified in the Tariff	50	0·2	—
Oxalates	20	0·2	15*
Salicylates not specified in the Tariff	100	0·2	—
Benzoates not specified in the Tariff	100	0·2	85*
Blue base, solid (dianisidine); dianiside base; tolidine	200	0·2	—
Primuline base; primulinsulphonic acid; scarlet base G, solid (paranitro-orthotoluidine); scarlet base R, solid (metanitro-orthoanisidine); red base G L, solid (metanitro-paratoluidine); red base K B, solid (chloro - orthotoluidine) and garnet base G C, solid (aminoazotoluol)	200	0·2	—
Naphthol A S (anilide of betaoxynaphthoic acid); naphthol A S G (diazoacetyltolidine); black base L B, solid (orthophenetidineazoalphanaphthylamine)	200	0·2	—
Paramidophenol; paranitrophenol and orthoamidophenolsulphonic acid	200	0·2	—
Saponine, scopolamine, suprarenine (in powder and tablets), theocine and veratrine	15% *ad val.* per 100 kilogs.	—	10% *ad val.** per 100 kilogs.
Butyl alcohol; and technical urea	30	0·3	15*
The following synthetic tanning products, whether liquid or solid :—ordoval G; ordoval 2 G; neradol N D and synthetic tanning material F	30	0·3	20*
Natural colouring earths, artificially dyed or coloured, without hydrate of aluminium	12	0·2	—
Synthetic indigo paste (more than 78 per cent. water)	100	0·5	80*
Colours not specified in the Tariff :			
(*a*) In powder.....	15	0·7	0·5
(*c*) Oil colours	25	0·5	0·2

Note.—The following products are to be classed as "Unspecified organic chemical products" under butyl alcohol, viz. :—acetate of adrenol; impure butyl acetate; methyl acetate; cyclohexanone; impure ethylacetic ether; methylcyclohexanone.

* This is the actual duty provision fixed by the Treaty. There is no co-efficient.

A decree imposes a specified standard of purity for chemical fertilisers, feeding stuffs, etc., and manufacturers and importers of superphosphate, nitrate of soda, and sulphate of copper must now pay the State 10, 20, and 30 centisimi respectively for each 100 kilogs produced or imported.

New Year's Honours

THE New Year's Honours List includes the following titles :—

Baronet.—Mr. William Waters Butler, F.C.S., for philanthropic services in Birmingham. He has been associated for many years with one of the largest breweries in the country, and was the first brewer to occupy the dual position of president of the Brewers' Society and of the Institute of Brewing. He is a member of the Council and a Life Governor of Birmingham University.

Knights.—Dr. Thomas Hudson Beare, Regius Professor of Engineering and Dean of the Faculty of Science, Edinburgh University; Professor John Bretland Farmer, D.Sc., F.R.S., member of the Advisory Council to the Department of Scientific and Industrial Research, governor of the Imperial College of Tropical Agriculture, Trinidad; Major Aston McNeill Cooper Cooper-Key, Chief Inspector of Explosives, Home Office.

Knight Commander of the Order of St. Michael and St. George.—Professor Mungo William MacCullum, Vice-Chancellor of the University of Sydney.

Commercial Intelligence

The following are taken from printed reports, but we cannot be responsible for any errors that may occur.

County Court Judgments

[NOTE.—The publication of extracts from the "Registry of County Court Judgments" does not imply inability to pay on the part of the persons named. Many of the judgments may have been settled between the parties or paid. Registered judgments are not necessarily for debts. They may be for damages or otherwise, and the result of bona-fide contested actions. But the Registry makes no distinction of the cases. Judgments are not returned to the Registry if satisfied in the Court books within twenty-one days. When a debtor has made arrangements with his creditors we do not report subsequent County Court judgments against him.]

BECKETT (W.), SONS AND CO., LTD., Heywood, manufacturing chemists. (C.C., 9/1/26.) £11 17s. 6d. December 1.

PREMIER CLEANSER CO., LTD., 118, Holborn, W.C., chemical manufacturers. (C.C., 9/1/26.) £14 4s. 6d. September 12.

Receiverships

CAPSOL PRODUCTS, LTD. (R., 9/1/26.) L. Aspinall, of 32, Talbot Road, Blackpool, was appointed receiver on December 22, 1925, under powers contained in first mortgage debenture dated February 6, 1925.

LISSON MANUFACTURING AND TRADING CO., LTD. (R., 9/1/26.) H. E. Fern, of 66, Finsbury Pavement, E.C.2, was appointed receiver and manager on December 14, under powers contained in first debenture dated March 23, 1925.

Mortgages and Charges

*[NOTE.—The Companies Consolidation Act of 1908 provides that every Mortgage or Charge, as described therein, shall be registered within 21 days after its creation, otherwise it shall be void against the liquidator and any creditor. The Act also provides that every Company shall, in making its Annual Summary, specify the total amount of debts due from the Company in respect of all Mortgages or Charges. The following Mortgages and Charges have been so registered. In each case the total debt, as specified in the last available Annual Summary, is also given—marked with an *—followed by the date of the Summary, but such total may have been reduced.]*

SOUTHAMPTON OXYGEN CO., LTD. (M., 9/1/26.) Registered December 21, £1,500 debentures; general charge *—. November 11, 1925.

STANDARD SOAP CO., LTD., London, E.C. (M., 9/1/26.) Registered December 21, £12,500 debenture, to R. Dobson, and another, 38, Mosley Street, Manchester; general charge.

SYNTHETIC PRODUCTS, LTD., London, E.C. (M., 9/1/26.) Registered December 15, £3,500 debenture, to Sir S. A. Coats, Ballathi, Stanley, nr. Perth; general charge. *£10,700. June 22, 1925.

WARD (H. W. D.), LTD., Fenny Stratford, chemical manufacturers. (M., 9/1/26.) Registered December 24, debenture to Barclays Bank, Ltd., securing all moneys due or to become due to the Bank; general charge. *Nil. September 5, 1925.

London Gazette, &c.

Winding Up Petition

LOW TEMPERATURE CARBONISATION, LTD. (W.U.P., 9/1/26.) A petition for winding-up has been presented by the Dursley Gas Light and Coke Co., Ltd., Dursley, Gloucestershire, creditors of the company, and is to be heard at the Royal Courts of Justice, Strand, London, on January 12.

Companies Winding Up Voluntarily

ASHWORTH AND SMITH, LTD. (C.W.U.V., 9/1/26.) By Special Resolution, December 11, confirmed December 29. T. Pilling, 30, Brown Street, Manchester, Chartered Accountant, appointed liquidator.

HOLLINGHURST AND CO., LTD. (C.W.U.V., 9/1/26.) By Special Resolution, December 10, confirmed December 29. H. W. Marten, Esq., F.C.A., 17, Basinghall Street, London, E.C.2, appointed liquidator. Meeting of creditors at the offices of the liquidator on Tuesday, January 12, 1926, at 3.30 p.m. (All debts will be paid in full and all contracts executed.)

Partnerships Dissolved

MORITZ (E. R.) AND PARTNERS (Edward Ralph MORITZ, Dillwyn Henry Fleetwood FULLER and Francis Edward Binny MORITZ), analytical chemists, 45, Great Tower Street, London, as from December 31, 1925, by mutual consent, so far as regards E. R. Moritz.

ROMAR POLISH CO. (Godfrey MARKS, Maurice MARKS, Archibald Thomas SPENS, and Thomas Kemplay IRWIN), Universal Polish manufacturers, 17, Bouverie Street, Paddington, London, by mutual consent as from December 29, 1925. Debts received or paid by A. T. Spens and T. K. Irwin who continue the business.

Business Names Registered

The following (trading name and address, nature of business, date of commencement, and proprietors' names and addresses) have been registered under the Registration of Business Names Act.

BARNOLD LABORATORIES, 718, Milverton Street, Kennington, S.E.11, research medical chemists, December 28, 1925. Alfred Arnold Pierce, 17, Argyll Road, Westcliff, and James Bartholomew Wallace, 60, Harborough Road, Streatham, S.W.16.

New Companies Registered

ASHWORTH AND SMITH, LTD., 4, Norfolk Street, Manchester. Registered January 4. To adopt an agreement with the Bleachers' Association, Ltd., and to carry on the business of bleachers, dyers, finishers and chemical manufacturers, etc. Nominal capital, £100 in £1 shares.

A. J. BELL, LTD., 47, Mark Lane, London, E.C.3. Registered December 29. Manufacturers of and dealers in manures, fertilisers, phosphates, grease, fat, tallow, chemicals, etc. Nominal capital, £5,000 in £1 shares.

FERTILISER MARKETING CO., LTD., 22, Molesworth Street, Dublin. Registered December 23. Manufacturers of and dealers in guano, superphosphate chemicals and chemical manures; manufacturing chemists, etc. Nominal capital, £1,000 in £1 shares.

WILLIAM FRASER AND CO., LTD., 86, Greenhill Road, Paisley. Registered December 29. Tallow melters, lard, oil, grease and tallow refiners and manufacturers, etc. Nominal capital, £10,000 in £1 shares.

G. S. HAY AND CO., LTD., Norway House, 21/24, Cockspur Street, London, S.W.1. Registered January 4. To acquire any invention relating to the manufacture and use of emulsions of all kinds; chemical manufacturers, chemists, druggists, etc. Nominal capital, £100 in £1 shares.

N. C. METAL CO., LTD., 49, Cannon Street, London. Registered January 1. Zinc and other metal manufacturers, metal and ore dealers, technical investigators, scientific and technical research chemists, etc. Nominal capital, £10,000 in £1 shares.

A. F. SUTER AND CO., LTD., 133, Fenchurch Street, London. Registered January 1. Shellac and gum importers, exporters and merchants, etc. Nominal capital, £20,000 in £1 shares.

TEXTILE DYES AND DEVELOPMENT CO., LTD. Registered January 1. Bleachers, dyers and finishers of woven textile and other fabrics, manufacturers, importers, exporters of and wholesale and retail dealers in dyes and other allied or residual products and gases, etc. Nominal capital, £2,000 in £1 shares. Solicitors: Kenneth Brown, Baker, Baker, Lennox House, Norfolk Street, London, W.C.2.

UNITED MOLASSES CO., LTD., Bush House, Aldwych, London, W.C.2. Registered January 1. Manufacturers and refiners of and dealers in sugar and any by-products thereof. Nominal capital, £1,000,000 in £1 shares (350,000 8 per cent. cumulative convertible preference and 650,000 ordinary).